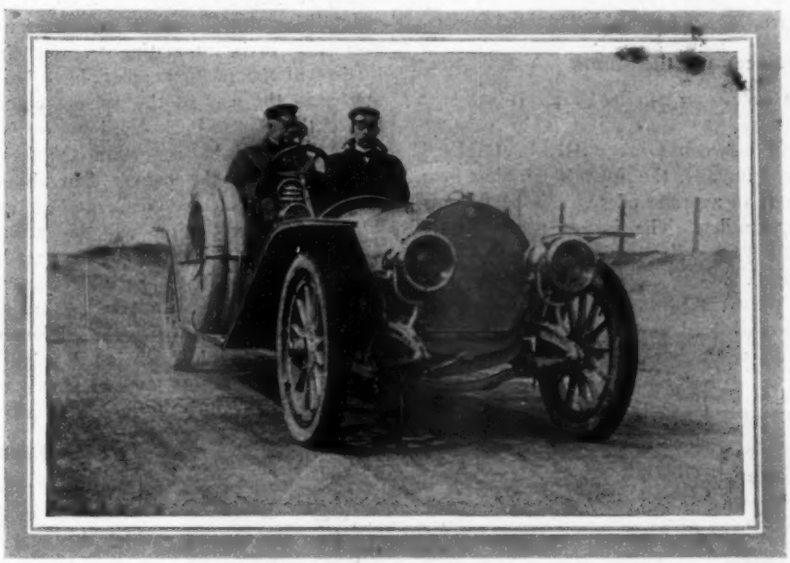
Vol. XIX New York—Thursday, October 22, 1908—Chicago No. 17

THE AUTOMOBILE

ALL IS READY FOR FOURTH VANDERBILT RACE

BEGINNING at daylight next Saturday morning will be run the fourth race for the William K. Vanderbilt, Jr., Cup over eleven laps of a 23.45 mile course, aggregating 257.983 miles. Seven European and twelve American cars have drawn starting numbers. They embrace for the most part cars of established records, and, in the matter of pilots, proven long-distance performers. In their number and the variety of their makes they are adequately representative of the fastest and most enduring brands of the foreign and domestic product. Some of them were contenders in the third Vanderbilt race. In one of the two Locomobiles, Joseph Tracy scored the fastest lap of that contest, and the Thomas, which George Salzman is to pilot, with Le Blon at the wheel, finished ahead of all the American cars in that memorable struggle. The Mercedes, entered by Robert Graves, was piloted by Jenatzy in the 1906 race, and the Hotchkiss, to be driven by Kilpatrick, is said to be a duplicate of the car that Elliot F. Shepard used. A second of the 1906 Vanderbilt Thomases will have at its wheel Howard W. Gill, a Baltimore amateur. The third Buffalo candidate is the Thomas used by Louis Strang in the Grand Prix race this year. Foxhall P. Keene will again drive his former Mercedes. Two other contenders were built for the last Vanderbilt—a Locomobile as an emergency substitute for Tracy's car, in the event of an accident in practice, and a B. L. M. not completed in time to compete.



Chairman Thompson of Cup Commission and Major Crowley of Irish Brigade.

Two of the new candidates for cup honors among the cars have already won distinction—the Isotta by its succession of triumphs in the Savannah, Briarcliff, Lowell and Sweepstakes; the Knox by finishing second in the Lowell contest, and the Acme by evolving third at Savannah and second at Philadelphia.

Interesting as will be the meeting of these seasoned racers and the addition of much new speed blood, it will not compare with the excitement of the competition among the coterie of daring, skillful, and competent drivers of long distance racing in this country has developed in the past two years. Public attention is to a considerable extent centered on a trio of drivers, whose performances during the season just closing and successes in very recent races have placed them at the head of the American speed squadron. Herbert Lytle, who was a Pope-Toledo pilot of former Vanderbilt races, is to man the Isotta he drove to victory in the Motor Parkway Sweepstakes. Louis Strang, who was at the wheel of the Isotta at Savannah, Briarcliff and Lowell, is to drive for Paul LaCroix, the Renault that put up a new world's record for 100 miles on Ormond beach. Strang's stirring struggle in a stock car Renault in the last 24-hour race at Brighton Beach, in which he alternated in the lead with the Isotta until his car was put out of the running by an accident, is fresh in the public mind, followed as it was by his close pursuit of Lytle in the Sweepstakes, also in a 40-45 horsepower stock car. The third member of the rival trio, George Robertson, will pilot the Locomobile he drove to victory at Philadelphia, following his capture of the last Brighton Beach 24-hour race in a Simplex.

William K. Vanderbilt, Jr., has secured Walter Luttgen, a veteran of the Long Island classic, to drive his Mercedes. At the wheel of Mr. Graves' Mercedes will be Emil Stricker, who has been a Porthos pilot in the Grand Prix contests. The Hotchkiss will be guided by H. J. Kilpatrick, who was the driver of the Shepard Hotchkiss when it scored the world's straightaway mile road record at Jamaica last spring.

Willie Haupt, J. B. Ryall, Cyrus Patschke, and William Bourque, drivers of no little experience in long-distance road and track contests in this country, will be found respectively in the seats of the Chadwick, Matheson, Acme, and Knox cup candidates. The pilotage of the Le Blon Thomas has been entrusted to George Salzman, who has won fame in endurance runs and road record trials, and the fate of the new Matheson racer to Louis Chevrolet, who several years ago scored not a few track records for Major Miller in a Fiat.

Leon Pouget, Brasier; Howard Gill, Thomas, and Thomas

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The A. A. A. in 1907 failed to secure legislative action or the sanction of the Governor to use State troops and the race was not run. It is interesting to note that those who howled the loudest at the postponement, have been foremost in casting obstacles in the way of the present contest being run. The building of the Motor Parkway, however, solved the problem for this year. Although but a portion of it has been completed, it is over that section of the course that the chief danger would arise and that is protected from end to end by a high wire fence. The militia protection will be afforded by Thomas Francis Meahers' Irish Brigade, a corps made up largely of veterans, who saw service in the Spanish war, and had its first service in the war of the Secession. In its ranks are many trained athletes. They will co-operate with the Pinkerton men, and Nassau county deputies, the soldiers being detailed more particularly at turns and in places where the greatest crowds are sure to congregate.

The Acme Six-cylinder, Rated at 60-Horsepower, to Be Driven by Patschke.

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That nine miles of cement parkway will be included in the 23.45-mile circuit, over which this year's Vanderbilt Cup race will be run, marks a new era in automobile road racing, the entire fulfillment of which will come with the completion of the entire 60 miles stretch of the Long Island Motor Parkway next season. The great American classic next year will be run over a speedway exclusively constructed for automobile traffic without speed limitations.

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dream. On October 6, two days before the last Vanderbilt Cup race, the directors of the national body passed resolutions directing the president of the association to appoint "a committee of three to consider various propositions to conduct automobile races on especially reserved rights of way, and, in view of the possibility of conducting the elimination race for 1907, to instruct the committee to at once carefully consider such propositions as may be submitted before referring them to the full Board of Directors."

William K. Vanderbilt, Jr., Jefferson deMont Thompson, and A. R. Pardington, the committee appointed by President Hotchkiss, considered propositions made for speedways in the States of New York, New Jersey, and Connecticut. The committee did not let grass grow under their feet, for on October 18 there was a conference of wealthy Long Island property holders at the Lawyers' Club, the outcome of which was the parkway proposition. Assurances of financial support came so promptly, not only from Long Island, but from automobile makers as well, that on December 18, 1906, the Long Island Motor Parkway was incorporated with a capital of $2,500,000.

Long months of persistent hustling and diplomatic effort to secure right of way followed. Success was finally attained. On June 6 of the present year work was begun with appropriate inaugural ceremonies near Central Park station, and rapid and efficient constructive work resulted in the present stretch being completed in ample time for the preliminary practice for the novel combination sweepstakes, run over the full Vanderbilt course on October 11, resulting in the winner of the principal race proving the speed qualities of the new course by setting up a new American road record, supplanting by a big margin the former figures established first by Heath, then by Hemery, and closely approached by Wagner in the last contest.

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The weighing-in of the cars took place at Gray's scales at Garden City yesterday. Several cars were over weight and found it necessary to reduce in order to make 2,644.8 pounds.

George Robertson and No. 16 Locomobile, a Likely Combination—Designer A. L. Riker in the Background on the Right.

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6	ISOTTA	60	Italy	Clarence V. Brokaw	Lytle	4	5.7	4.72	Multi-disc	118	Michelin
7	MATHESON	60	America	Matheson M. C. Co.	Ryall	4	6	6	Multi-disc	128	Diamond
8	THOMAS	80	America	E. R. Thomas Co.		4	6	5.7	Three-plate	112	
9	HOTCHKISS	120	France	Hotchkiss Import Co.	Kilpatrick	4	7	6.28	Cone	104	Michelin
10	BRASIER	96	France	H. Payne Whitney	Pouget	4	6.39	5.5	Cone	104	Michelin
11	ACME	60	America	Cordner & Flinn	Patschke	6	4.99	5.5	Cone (cork inserts)	108	Diamond
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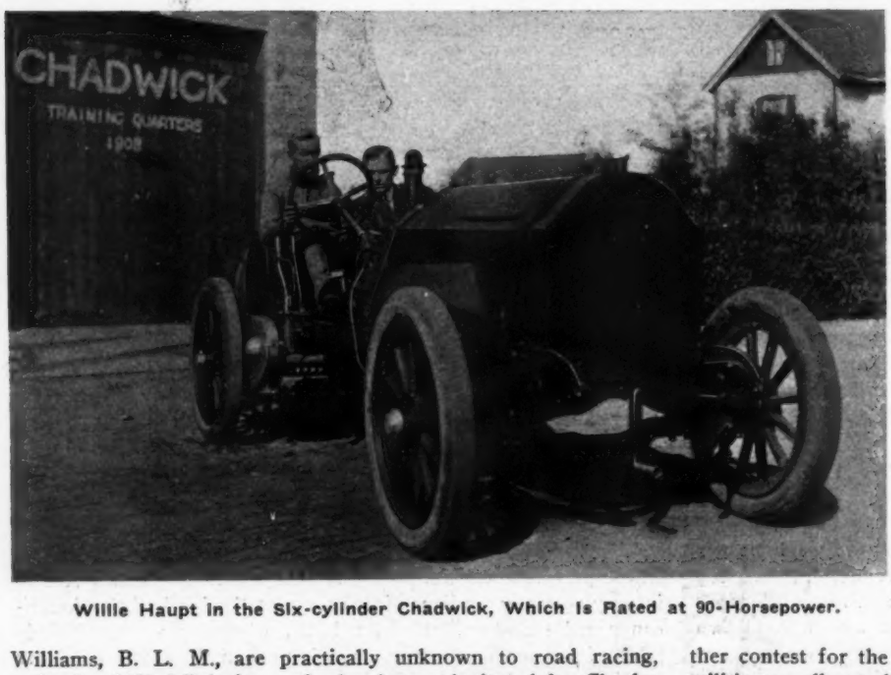

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The Two Matheson Candidates for Cup Honors.

Luttgen and Mate Don't Look Like Daredevils.

WHAT FRANCE WANTS FOR 1909 INTERNATIONAL RULES

PARIS, Oct. 15.—France wants a maximum bore of 140 millimeters (5.51 inches) for a four-cylinder engine, and a minimum weight of 1,984 pounds as the essential conditions of the 1909 Grand Prix and of all international races held throughout the world. It was a foregone conclusion that the 155 millimeter rule and 1,100 kilos minimum weight would be abandoned after this year, for the 1908 season has proved that cars are too fast for tires to stand the strain.

The Sporting Commission's regulations will be submitted to the international conference of recognized clubs, to be held in Paris, October 19, and will doubtless come in for severe criticism, Germany, Italy, and England being in favor of a reduction to 130 or even 120 millimeters for the four-cylinder engines. As the French delegates have instructions to hold out for the 5 1-2-inch limit, the fight is likely to be a keen one. The argument of the other members of the congress is that with 140 millimeters and the reduced weight cars will be as fast as this year, and there will be danger of the tire falsifying the mechanical results.

When the present rule was formulated at Ostend, Germany was in favor of 135 millimeters, while France held out for 160. In a spirit of compromise France came down to 155, the belief then being that the reduction would produce a car slightly slower than the square motors of 170 and 180 millimeters bore, and as Henry Brasier expressed it, "It would be valuable to slightly reduce the bore each year and still maintain the same average speed." The possibilities of long-stroke engines were not sufficiently realized by the experts, as is proved by the fact that contrary to general expectations, more power was obtained with the restricted bores than with the unlimited engines. With a bore of 130 millimeters an average long-distance speed of nearly 70 miles an hour is possible on a good course, and at such a rate of travel tires are near their limits of resistance. It is probable France will have to come down to 155 millimeters.

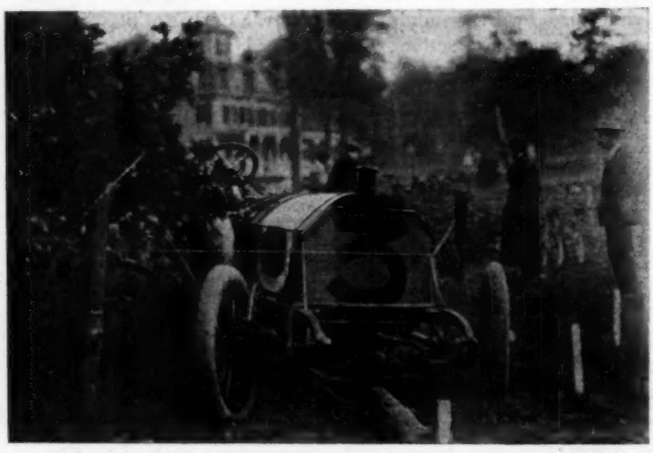
The question of the changing of wheels will come up for discussion at the meeting, with the probable result that this departure from standard racing practice will be allowed. The question was brought forward prominently last year, when S. F. Edge asked to be allowed to use Rudge-Whitworth dismountable wheels. His request was refused, and he thereupon commenced an active campaign that was doubtless more profitable than winning the Grand Prix. As the last Grand Prix was largely lost to the French by the failure of rims and tires, and as the English device allows a reduction in weight of 140 pounds per car, it is likely that France will have no objection to the change.

For voiturettes it has been decided to increase the bore where two and four-cylinders are employed. For one-lungers 100 millimeters remains as the maximum bore. For two-cylinder cars the limit of bore has been carried from 78 to 80 millimeters, and for four-cylinder engines the maximum bore will be 65 in place of 62 millimeters. This, however, will not affect the international conference, the French voiturette race being considered a national affair.

What the International Committee Will Recommend.

PARIS, Oct. 20.—At a meeting to-day of the racing committee of the International Association of Recognized Automobile Clubs it was decided to recommend that the rules for high speed racing in 1909 limit the cars to a minimum weight of 900 kilograms (1,984 pounds) with a cylinder bore of 133 millimeters (5.23 inches) limitations.

Dennison (Knox) Changing a Demountable Rim.



Robert Graves's Mercedes After Its Sunday Accident.

USE OF THE FARM TRACTOR IN FRANCE

By W. F. BRADLEY.

BOURGES, France, Oct. 15.—Central France, the most highly developed agricultural district of the world, has been selected as the spot for the first International Agricultural Motor Exhibition. But though this is a country where the land is made to produce its maximum, it is not one in which mechanical aids to agriculture have been most highly developed. Thus, when the competition for mechanical means of plowing was commenced, the three machines which lined up in front of the judges were respectively from Chicago, Bedfordshire, England, and Paris. Though the International Harvester Company's machines are household articles in France, the American tractor is a new feature, and as such was watched with considerable interest. The British Ivel machine is one which has made itself known in the colonies and foreign countries during the last three or four years, and the French Castelin is practically a new comer. The method of operation on both the American and British appliance was for the tractor to pass over the ground with a plow in the rear, one man operating the tractor and another looking after the plow. The French machine remained stationary, dragging its plow through the ground by means of a couple of winding drums, a fixed point, a pulley, and a steel cable.

International Harvester Tractor in Actual Service.

The Ivel Tractor Doing Some Real Practical Work.

Castelin Tractor Coping with a Wire Cable.

All three machines were put through practical tests on a large field divided off into equal parts, the award of the judges to be made on the speed with which the work is done, is regularity, and economy of operation. No report has yet been made, but it is evident that the prize distribution will be between the Britisher and the Yankee only.

The International Harvester Company's tractor consists of a single cylinder horizontal engine, mounted on a four-wheel carriage. The engine is of the long-stroke stationary type, with two huge flywheels, and a modified form of water tank forward, the water on leaving the engine being sprayed through a fine wire gauze screen, then collected in a tank below. The valves are in the head, the exhaust only being mechanically operated, and the engine controlled by a governor operating on the exhaust lift.

The Ivel machine is a compact three wheeler, having as its power plant a double opposed engine of 6 x 6 inches bore and stroke. First connection with the transmission gear is a leather-faced cone clutch, the gear being reduced twice before drive is finally taken to rear axle by a single chain. Though water cooled, the engine has no radiator, the necessary amount of water being carried in a large tank at the rear of the machine and circulation assured by thermo-syphon. The road wheels are all metallic, the two rear ones taking the drive, and the single front one being steering. When used across country, transverse ribs are attached to the face of each of the rear wheels, being detached when running on macadam roads.

The Castelin tractor has a single-cylinder vertical De Dion motor as its power producer, the bore and stroke being 4 3-10 x 5 1-10 inches. The engine is water cooled, has automatic inlet, mechanical exhaust, and ignition by storage batteries. Power is transmitted to the front wheels by means of a low-reducing gear, a countershaft and side chains. The rear wheels are steering, with control by tiller. For stationary work, the drive is taken in a similar manner from a separate countershaft bearing small pinions to the drumshaft by means of side chains. When required for plowing, the tractor is immobilized by dropping down a powerful strut and fixing in the ground a couple of posts between which is laid a chain to carry the pulley, around which the cable runs. The practical operation is the simple one of setting the winding drums in operation and drawing the plow through the ground, one man remaining in charge of it, while another occupies himself with the engine.

Although interesting comparisons could be made by watching the three machines at work together in one field, it was impossible to arrive at very definite conclusions without detail figures of cost of operation in each case. The French tractor, having the lowest power and the lowest initial cost, would at first sight appear to be the most economical, but, as the tests showed on rough ground, the cable had difficulty in performing what was accomplished easily by the two hauling tractors.

After the plowing tests the tractors were invited to operate a reaper, which task was very successfully accomplished by both

the Ivel and the International Harvester machine; the Castelin did not take part in this. Finally, by means of belt connection, the three tractors were put to stationary engine work, driving various types of farm machines.

The feature of the exhibition held for one week in the town of Bourges was the number of stationary engines of various types operating threshers, grinding mills, choppers, churns, saws, etc. Single cylinder machines of both horizontal and vertical type were in the immense majority, and varied in power from 1 to 30 horsepower. Gasoline was practically the only fuel used, the alcohol section, which it was expected would be important, failing to attract entries; steam was unrepresented, with the exception of one English tractor. Single cylinder engines, vertical type, with mechanically operated valves and high-tension magneto, mounted on a light carriage with two wheels, were shown in numbers, generally linked up with a water pump, or provided ith pulley for belt connection to various machinery. It is in this direction that the greatest opening for the introduction of internal combustion motors to agriculture in France is likely to be found.

During the exhibition lectures were given by experts on the application of motors to farming, comparative costs supplied, and general pioneer work undertaken.

GOOD RESULTS OBTAINED WITH VARIOUS FUELS IN FRENCH TEST

PARIS, Oct. 15.—Gasoline is not the only fuel on which automobiles can be run economically, as is proved by the taxicab and delivery vehicle competition which has just taken place in the neighborhood of Paris. The competitors were given a difficult course in the vicinity of the capital to be covered each day, giving a daily distance of 76 miles. Sixty per cent. of the course was over rought paving stones such as the environs of Paris alone can provide; 30 per cent. was over bad macadam; the rest of the course was good going. Hills, with a maximum grade of 12 per cent., tested the climbing abilities of the cars.

Gasoline, White Spirit, carburated alcohol, benzol, and any fuel the competitor desired had to be used on five successive days. Before each fuel test the vehicles went over the course with the fuel they were to use on the following day, but without any other control than that of a time schedule. This allowed them to make the necessary adjustments and tune up the carbureter for the fuel test, all the work being done by the driver only, no mechanics being allowed on the cars.

The annexed table tells the story of the competition, the chief feature of which was the good results obtained on various fuels and the small amount of fuel used. There were no mechanical defects except on a Cottereau, which overheated, was supplied too suddenly with cold water, and cracked a water jacket. The vehicles engaged consisted of a couple of single-cylinder De Dions of 100 by 120 bore and stroke, one having an hotel omnibus body and the other a closed delivery van, both loaded with sacks of sand; Unic had a four-cylinder 12-horsepower hotel 'bus and a similar chassis with a delivery body; Cottereau had a four-cylinder cab, 85 by 105 bore and stroke; and a three-cylinder engine, which failed to finish; Vinot had a 80 by 110 four-cylinder taxicab; Bayard-Clement had a couple of two-cylinder chassis, 85 by 110 bore and stroke, developing 10-horsepower, the one carrying a taxicab body, the other a closed delivery van. In each case the full load was carried in the shape of ballast, and interior dimensions were demanded for all delivery vehicles. The following table shows the comparative consumptions with the four different fuels employed. It is worth noting that the circuit was the same for each test, the roads always dry, and the weather fine from beginning to end.

	Vehicle.	Cylinders.	Bore and Stroke.	H. P.	Total Weight, Pounds.	Fuel Consumed, 76 miles. Gasoline, 680 deg. gallons.	White Spirit, gals.	Alcohol, 50% gals.	Benzol, gals.
1	De Dion - Bouton 'bus.....	1	100x120	8-9	4,890	3.04	2.63	3.30	2.60
2	Unic 'bus	4	75x119	12-14	4,386	2.53	2.48	2.92	2.17
3	Cottereau taxicab	4	85x105	16	3,538	3.62	3.16	3.47	3.22
4	Vinot-Deguingand taxicab	4	80x110	12-16	3,119	2.56	2.62	2.89	2.20
5	Unic taxicab ...	4	75x110	12-14	2,976	2.29	2.17	3.01	1.84
6	Bayard-Clement taxicab	2	85x120	10	2,436	2.05	1.79	2.17	1.55
7	Demeester delivery van	4	72x80	10	2,050	2.99	2.18	2.43	1.70
10	Unic delivery van	4	75x110	12-14	4,250	2.40	2.39	2.69	2.03
11	De Dion - Bouton delivery van ..	1	100x120	8-9	5,522	4.04	3.62	3.60	2.86
12	Cottereau delivery van	3	85x105	10	4,772	5.87	Retired.		
13	Bayard - Clement delivery van ...	2	85x120	10	3,042	1.95	1.98	2.21	1.81

With one exception the carbureters were not changed for the tests with different fuels, the drivers merely changing the floats and in some cases putting in different nozzles. There was considerable difficulty in starting up cold on alcohol, but once going the engines ran well and seemed to develop as much power as with the other fuels. The slight difference in time at the various controls shows that the engines were not disadvantaged by the frequent changes of fuel. Final awards will be made on a price basis only, the car in each class having the lowest expenditure for fuel being the winner. Owing to the small number of entries in the various classes the competitors are grouped in the accompanying table.

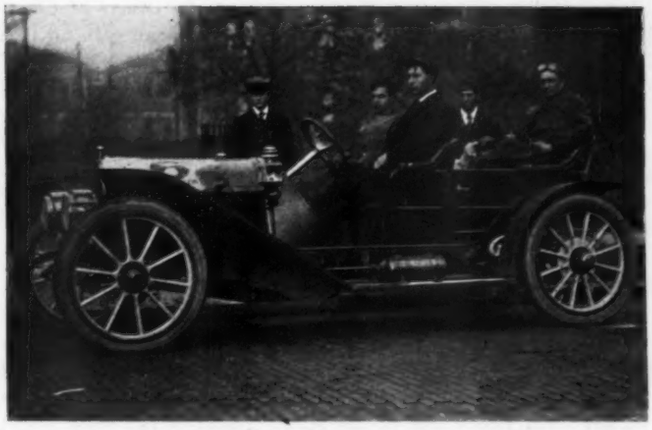
JACOB'S LADDER TO HAVE AN IMPROVED ROADWAY

BOSTON, Oct. 19.—One of the most important contracts for State road, in the opinion of autoists, ever given out by the Massachusetts Highway Commission, was that which has been awarded to Joseph F. McCormick, of East Providence, for constructing a road around the famous Jacob's Ladder grade in the Berkshires. The contract involves an expenditure of $37,352, and by its terms requires that the new road shall be completed by August 15, 1909. To do the work within the time limit the contractor will have to use a double force all the time. He has already begun getting the materials on the ground and intends to make a big start this fall.

Jacob's Ladder, with a maximum grade of 16 per cent., lies on the most direct route between Lenox, Pittsfield and the western towns and Springfield and other places in the central and eastern part of the State. It can only be avoided by a long detour over poor roads and ever since automobiles came into use has been one of the most troublesome grades in the State. Incidentally Jacob's Ladder has been a gold mine for the farmers in the neighborhood, as they have earned good pay hauling automobiles over the hill.

The new State road will have a maximum grade of 6.36 per cent. It will start at the end of the State road in Chester, and for some distance will be built on the site of the present highway, three new concrete bridges being a part of the contract. After a stretch of new road on the old site, the route will swing northward, paralleling the present road, but with easier grades. It will then return to the present right of way and follow it to near the base of Jacob's Ladder. From there another detour will be made of about 6,500 feet around the hill. The contract calls for the construction of 3 1-2 miles of road.

C. G. Bleasdale and His Maxwell, a Perfect Scorer.



Perfect Score Thomas Light "Six," Geo. Sperry Driving.

FOUR ADJUDGED PERFECT IN CLEVELAND TEST

CLEVELAND, Oct. 17.—The most successful endurance contest ever held under the auspices and direction of the Cleveland Automobile Club came to a close in this city last night, with four cars out of the original nine starters having clean scores.

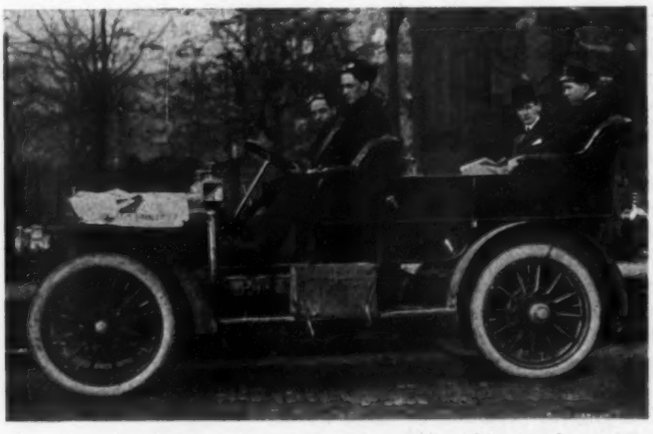
The committee in charge had some mighty hard points to decide. At first brush the Maxwell four-cylinder roadster, driven by C. G. Bleasdale, was given the only perfect score, but after three hours' consideration, and having had a number of club officials, entrants, and drivers on the carpet, the Garford touring car driven by E. E. Ernest, C. S. Carris' Franklin, and the new Thomas light six, handled by George Sperry, were declared to have perfect records. This decision was not arrived at until very late last night, the chairman of the contest committee, W. F. Bonnell, being called from his home to reconsider his original decision.

When the third day's work had been finished, and D. E. Beecroft, of Chicago, was examining the cars, it was found that the entrant of the Garford touring car, A. R. Davis, secretary of the Garford company, had been told that if he would enter at that late hour, it being the afternoon before the start, his car would not have to take the brake test. His machine was brand new, taken off the salesroom floor, and was admittedly not in condition for such a contest. With the knowledge that he would not be penalized for loose brakes, his car went in, coming through perfectly. Driver Ernest, when ordered to take the brake test, refused to do so, and 'phoned for Davis to come to the examination. Upon arrival Davis told his side of the story, but the technical examiners could not remit the test, and Davis then stood for it, the car going too far on the foot test. Davis later appeared before the committee and clearly stated his side of the case, also declining to protest the decision in case his car was penalized, as he did not wish to make trouble for the local club. Under the circumstances, and upon the recommendation of Mr. Beecroft, the brake test was not counted at all. This allowed the Garford and Thomas to have perfect scores, the latter car having originally suffered a penalization of five points on the hand brake test.

The Franklin's case was very queer. It appeared that the car ran many miles out the right way owing to wrong confetti marking, and, being compelled to "beat it" at a fast clip, ran out of oil. This gave the car a penalty of twelve points on the second day. After the contest was over, however, it was found that many observers had been lax, and that oil had been used in other cars in violation of the rules without having been noted. The drivers afterwards admitted this, claiming that, owing to the lateness of their entry, they had not studied the rules carefully. It would have been impossible to penalize all cars, owing to lack of clear information, and had the Franklin penalty stood, it would have been manifestly unjust to that one car. Consequently Chairman Bonnell gave the Franklin a clean score under the circumstances.

The run was a most severe one for several reasons. In the first place the schedule called for a straight twenty miles an hour, with an average daily distance of 157 miles, and four controls each day, the object of which will be explained later. This meant that the cars could keep ahead of their schedule but a few miles, for whatever they gained would be quickly lost, as they had to wait to allow the schedules to catch up. Combine this with a twenty mile average on the last portion of the

C. S. Carris "Beating It" in Clean Score Franklin.

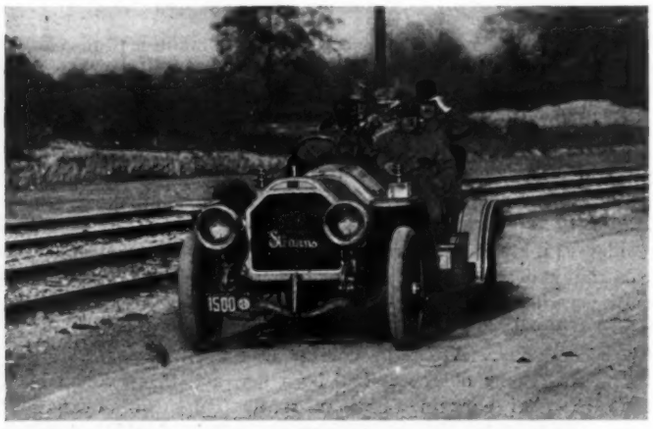


E. E. Ernest's Garford "30"—Another Clean Scorer.

day's running, which took the cars through the streets of Cleveland when the traffic was the densest, and one can gain an idea of the speed required.

The perfect scores commenced to go by the board the first day, when a loosened screw in the coil box of the Stoddard-Dayton caused trouble. Driver Moore broke both his bonnet and battery box seals before locating the trouble in the coil, and suffered a penalty of 53 points. All the other machines ran into the control that night with nary a penalty, but early the next day the severe pace commenced to tell.

The first car to get into trouble was the steady little Chalmers "30." The motor died, and from its actions Driver Stickney went after his spark plugs, changing them, the trouble then being found to be dead batteries. Being unable to locate an extra set in the car, Stickney telephoned ahead to Chagrin Falls, and after waiting a half hour, one of the passengers found some tucked away under one of the seats. Stickney hurriedly wired them up, and a few minutes later was tearing along. Incidentally, he passed the relief car from Chagrin Falls at such a fast clip that he was not recognized. His car was penalized, of course, for breaking the seals and work done, but he might



Oldfield Carrying the Officials in the Stearns "Six."

have made up his lost running time had it not been for the fact that the short controls prevented. As it was, he drew 209 points.

Then Wedler's Garford roadster, the only amateur entry, found trouble, the radiator springing a leak which necessitated refilling twice. This penalized him 14 points.

Johnson's Jackson was the next to suffer, breaking a main bearing just out of Youngstown. This put the car down and out, and at the end of the second day left the Garford touring car, Thomas light six, Maxwell and Chalmers "40" fighting for honors with clean scores, the Franklin having drawn the penalty which was afterward removed.

Early the next morning the Chalmers "40" went out, the fan breaking and tearing a hole in the radiator. Driver Emerson could have continued without the fan, but he was unable to plug the radiator leak. Nothing else was penalized that day, the cars coming through to the examination in splendid shape, surprising even Examiner Beecroft. In fact, after carefully looking over every machine as to wheels, axles, springs, motors, clutches, fans, bearings, differentials, mufflers, steering mechanism, transmissions, ignition systems, etc., only one lone car was found to have the slightest trouble, the amateur Garford, which, by the way, was entered at the last moment without preparation, having the front wheels sprung one-quarter of an inch. Everything else was ship-shape throughout on all the machines, and the condition of the springs after the many hard bumps was universally commended. Not one had sagged a quarter of an inch.

Then came the committee meeting Friday night, and the changing of penalties, as noted above.

The only trouble with the entire event was the fact that it was really gotten up at the last moment. six of the nine entries coming in the day before the start. Then, too, the confetti was sprinkled by a man who knew nothing about such work, and was carried in a competing car. Aside from this, the contest was handled in a brisk, snappy manner, and plans are even now being made to repeat it in the future.

The event just finished introduces to the trade a new figure—W. B. Bonnell, next president of the Cleveland Automobile Club. This was the first event ever handled by Mr. Bonnell, and although handicapped by the work of some of the club officials, he swung the contest with admirable vigor.

To D. E. Beecroft, vice-chairman of the Technical Board of the A. A. A., is due the credit of making the contest a real event when everything looked black. At the conclusion of his work Friday evening he was given a real ovation by the crowd in the club rooms, and a motion to ask him to assist him in the next run brought a hearty assenting vote.

Of secondary consideration in the minds of the contestants, but of considerable import to the Automobile Club officers, was the "speaking" feature of this run. An effort, quite successful, was made to interest the farmers in this contest, and to bring home to them in a forcible manner the best way to secure good roads throughout the State. Barney Oldfield, with his six-cylinder Stearns racer, carried a number of well-known Cleveland citizens along, who made addresses at the short controls to the farmers who had previously been notified of their coming. At these controls every car was held for ten minutes, and as a result, by the time the speaking commenced anywhere from three to nine cars, dust covered and showing the strains of travel, were lined up. A crowd was naturally drawn, then the speakers introduced the subject of good roads, the best way to secure appropriations for this purpose, etc. But, be it related, the speaker generally made one mistake, for Barney Oldfield was introduced, and the fact that he had his racing car along was mentioned. Whereupon Barney seemed to rivet the greater share of the farmers' attention upon himself and car.

Following is the summary of the run:

No.	Car.	Driver.	H.P.	Cyls.	Score.
8.	Maxwell	C. G. Bleasdale	28	4	1,000
6.	Thomas	George Sperry	40	6	1,000
7.	Garford	E. E. Ernest	30	4	1,000
3.	Franklin	C. S. Carris	28	4	1,000
2.	Garford	C. R. Wedler	30	4	946
1.	Stoddard-Dayton	H. S. Moore	45	4	922
12.	Chalmers-Detroit 30	J. H. Stickney	30	4	791
4.	Chalmers-Detroit 40	Sam Emerson	40	4	——
9.	Jackson	Grant Johnson	40	4	——

PHILADELPHIA NOW WANTS ANNUAL RACE.

PHILADELPHIA, Oct. 19.—Since the phenomenal success scored by the Quaker City Motor Club with its 200-mile Founders' Week race little else has been talked of here. Some of the more enthusiastic of the Quakers are even talking of putting on a 24-hour race in November, but there is a division of sentiment over this scheme, and it will likely be abandoned for the reason that November weather is not suitable for an all-night grind and that a profitable "gate" is improbable.

The city fathers are so enamored of the thrilling wind-up the Q. C. M. C. furnished them for the Founders' Week program that when sounded on a proposition to make such a race an annual fixture in Fairmount Park every man-Jack of them acquiesced and said that it would be a good thing to advertise the city.

The "consistency cup" for regularity of running throughout the contest was awarded to the Acme, driven by Patshke, which was the cup for second place.

Last Wednesday a committee of inspection from the Fairmount Park Commission went over the course and found that in two working days it had been restored to its former condition; in fact, it is in better shape, for while many other of the park roads were inordinately dusty as a result of the dry weather, those roads forming the 7.8 mile course were clean and smooth. The $2,500 bond put up by the club to guarantee repairs will be returned less than $500 shy. The $25,000 bond put up to make the city safe, in event of suits instituted for injuries from accidents, will be returned intact.

THE UTILITY OF AUTOMOBILE CLUTCHES

By THOS. J. FAY, E. E., President Society of Automobile Engineers

THERE are very few clutches of the type involving the expanding band, and, as a rule, they are not so good as to warrant their use. The mechanism required to move the shoes is complex, and centrifugal force is bound to play an undesirable part. If the shoes are of manganese bronze with cork inserts, as in Fig. 3, the surfaces will hold to the work to a marvelous extent, provided the mechanism is such as to serve for the clutching function to an adequate degree. Cone clutches of the conventional sort were once so prevalent as to lead one to the conclusion that they were the permanent standard. Fortunately, there is no such thing as a standard, excepting in so far as principles must hold throughout the designs.

Fig. 3—Shoe of expanding band clutch, fitted with cork inserts.

The earlier cone clutches were faced with leather, riveted onto the periphery, without any means of providing for evenness of contact. The leather thus did not serve the purpose well, and the next important improvement was by way of flat steel springs under the leather facing, with a view of pressing the leather into contact at numerous points around the entire circumference. This scheme made cone clutches possible. For a time after this innovation it looked as if cone clutches were the acme of perfection, but the adoption of cork inserts protruding through the leather rendered the clutches far more stable and lasting. Cork inserts, if well placed and of sufficient surface, work very well indeed without any leather.

Fig. 4 shows a leather-faced cone clutch, with the cork inserts located around the periphery. The same figure will serve to illustrate this particular type in general, since the only difference lies in the application of the cork, in which event the section of the aluminum spider must be provided with inwardly projecting "bosses" in which the holes may be drilled to take the corks. With the cork inserts there is a slight increase of weight if leather is used as well. If, on the other hand, cork alone is used, the weight is lower for the cork insert cone clutch than it is if the leather facing is used. Leather is heavy, especially if we consider that the requirement for the average cone clutch is not far from 75 cubic inches. It must also be borne in mind that the leather is at the extreme radius, where weight is the greatest detriment. Through the courtesy of the National Brake and Clutch Company I am enabled to offer some data of the performance of cork in clutch service, which data was procured by that company for the purpose of aiding designers in the process of applying cork to the class of work of the subject and for brake shoes, such as are used in automobile and other work.

Fig. 5 gives the pressure and equivalent friction of cork on steel without lubrication, the cork being inserted in cast iron discs or plated of sufficient thickness. As will be seen by inspecting the chart, the frictional resistance for one pair of plates without the cork inserts is about 80 pounds, if some 500 pounds pressure is applied. It will also be seen that 20 corks in a similar plate, under the same pressure, just about doubles the friction. This is equal to saying that the clutch ability is double. The same curve or chart shows a variety of possibilities, using various numbers of inserts, and it shows that the resistance is not in direct proportion to the number of inserts, considering a given pressure. The exact test as reported by Prof. John R. Nichols, of Harvard, is worthy of note, in that it gives more exact values than can be taken from a chart, although the latter affords a bird's-eye view of the whole performance, which would be lost in a tabulation.

TABLE OF PRESSURE AND FRICTION OF CORK INSERTS.

Load in Pounds.	PLATE NUMBERS USED IN THE TEST. No. 1-0 Cork.	No. 2-11 Cork.	No. 3-14 Cork.	No. 4-17 Cork.	No. 5-20 Cork.	No.5-48 Cork.
	RESULTANT FRICTIONAL RESISTANCE IN POUNDS.					
50	7.5	17.5	17.5	17.5	17.5	17.5
100	15	35	35	35	35	35
150	22.5	53	53	53	53	53
200	30	63	70	70	70	70
250	38	70	85	88	88	88
300	45	77	94	105	105	105
350	53	85	101	117	122	123
400	60	92	109	125	131	141
450	68	99	117	133	139	159
500	75	106	124	141	148	176
550	83	113	132	149	156	...

The corks, one inch in diameter in holes (put in wet under pressure), were in plates of cast-iron five inches wide by ten inches long, and were smoothed down to a uniform bearing and pressed against a clean dry steel surface; the cast-iron plates were ¾ inch thick. The resistance offered was that of the plates with cork inserts considering the loads in pounds as given at a low speed. The consequences of a high velocity was not here taken into account. This is not necessary to consider in ascertaining the coefficient of friction, although it may be well to keep the difference in the mind's eye, against the time when the conditions to be met, in any given case, may introduce a variable.

The question will naturally arise as to how much of the friction is due to cork, as against other materials, such as dissimilar metals in contact with each other. This is a matter that can be disposed of if tests of the dissimilar metals are taken. The following tabulation will show the results of metal to metal contact, under the same conditions and by the same authority, made at the same time and place. The test then should bear a close relation. It will, of course, be well to keep before the mind's eye, the fact that the tests are associated with the accuracy, naturally expected, of a laboratory of some pretensions.

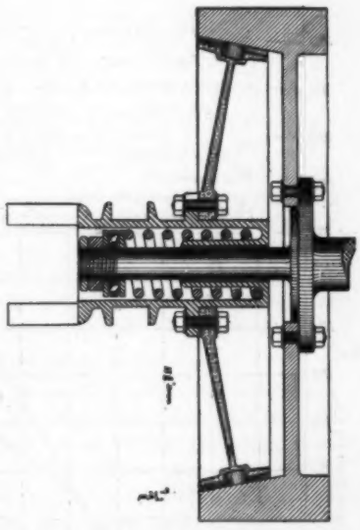


Fig. 4—Leather-faced cone clutch with cork inserts around the periphery of facings of the male member.

PRESSURE AND FRICTION METAL TO METAL CONTACT.

Load in Pounds.	Cast Iron on Cast Iron.	Cast Iron on Steel.	Bronze on Cast Iron.
	RESULTANT FRICTIONAL RESISTANCE IN POUNDS.		
50	8.1	7.5	7
100	16.2	15	14
150	24.3	22.5	21
200	32.4	30	28
250	40.5	38	35
300	48.6	45	42
350	56.7	53	49
400	64.8	60	56
450	72.9	68	63
500	81	75	70
550	89	83	77

The tests as above indicated for metal to metal contact were made on plates ten inches long by five inches wide, with polished

surfaces, free of any foreign substance. The area of the plates then was $10 \times 5 = 50$ sq. in., and for 500 pounds the pressure per square inch was:

$$P = \frac{500}{50} = 10 = \text{pounds per square inch.}$$

It is plain to be seen that differences in metals influence the friction, but it is equally plain that cork increases the friction very greatly indeed, in comparison with metal to metal, no matter what metals are used. If the coefficient of friction is taken as the resistance divided by the pressure, then the coefficient for bronze on cast iron may be taken as:

$$f = \frac{70}{500} = 0.14.$$

On the other hand, if cork inserts are used in the bronze plates on a basis of 20 per cent. cork surface, the coefficient of friction will be:

$$f = \frac{131}{500} = 0.262.$$

These relative results are of no great value, because they do not take into account practical conditions that cannot be avoided. In practice, oil will furnish a slippery surface in the case of the metal to metal contact, and unless the pressure is very high the slippery surface cannot be eliminated. On the other hand, the cork coefficient of friction does not seem to be affected by the oil film to any marked degree, and high pressures are not required to get rid of the slippery surface. The life of the members will be far longer if the pressure is low, and with cork the life can be prolonged because the pressure *can be low*, even if oil does get on to the surfaces, and in an automobile it is almost impossible to keep it off.

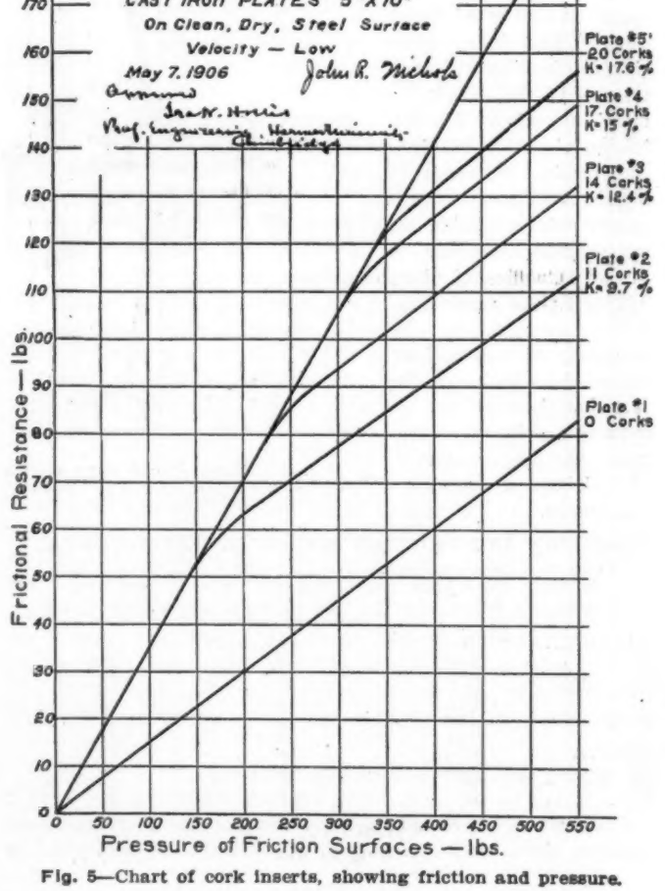

"COMPO" TESTS
PRESSURE vs FRICTION
CAST IRON PLATES 5"X10"
On Clean, Dry, Steel Surface
Velocity — Low
May 7, 1906
John R. Nichols
Plate #5 48 Corks K=42.4%
Plate #5' 20 Corks K=17.6%
Plate #4 17 Corks K=15%
Plate #3 14 Corks K=12.4%
Plate #2 11 Corks K=9.7%
Plate #1 0 Corks
Frictional Resistance — lbs.
Pressure of Friction Surfaces — lbs.
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180
0 50 100 150 200 250 300 350 400 450 500 550

Fig. 5—Chart of cork inserts, showing friction and pressure.

If, however, a clutch is designed for metal to metal contact, involving enormous pressures, it will not be very practical to insert cork as a final act of defense, because the conditions will not be the best for cork. Failures oftentimes result because the conditions that are necessary under certain circumstances are impressed into service under a change in the nature of the requirements. In the use of cork inserts there are two fundamental conditions to be taken into account, *i.e.*,

(*a*) When the pressure is not so high as to cause the metal to contact. The time when cork is in contact with metal.

(*b*) When the pressure is so great as to compress the cork enough to indicate metal to metal contact.

If the pressure is applied directly, as in the case of the loaded flat plate bearing upon a "platen," for the purpose of ascertaining the coefficient of friction, the resistance will be equal to the load in pounds, multiplied by the coefficient of friction in any given case, but if the pressure is increased enough to compress the cork and enable the metals to contact and to press on each other, there will be an added resistance which may be determined as follows:

$$R = f\,W + N\,A\,(K - a),$$

where R = resistance to motion in pounds;
W = total load on plate in pounds;
f = coefficient of friction of the metals used;
A = total area of the plate in square inches;
K = area of the cork in per cent. of A;
N = a constant, depending upon the nature of the materials and the prevailing conditions;
a = another constant.

This formula, devised by Prof. John R. Nichols, was extended and applied by him in the manner as follows:

The first modification of the formula is indicated as follows:

$$r = fw + N\,(K - a).$$

where r = the frictional resistance in pounds per square inch;
w = the pressure in pounds per square inch.

In a purely engineering sense, the formula is claimed to be accurate to a satisfactory degree, even above the critical point. The critical point, according to the authority stated, will occur as follows:

For cast iron:

When $W = 0.7\,A\,(K - 5.6)$
$w = 0.7\,(K - 5.6)$

For bronze:

When $W = 0.66\,A\,(K - 5.4)$
$w = 0.66\,(K - 5.4)$

According to the complex formulæ, the values of R and r may be found as follows:

For cast iron:

$$R = 0.16\,W + 0.118\,A\,(K - 5.6)$$
$$r = 0.16\,w + 0.118\,(K - 5.6)$$

For bronze:

$$R = 0.14\,W + 0.126\,A\,(K - 5.4)$$
$$r = 0.14\,w + 0.126\,(K - 5.4)$$

In all of the above cases the cork inserts are, of course, used in the cast iron, and in the bronze discs. The cork must be especially prepared to correspond with the quality known on the market as "Compo," as natural cork does not perform in quite the same way. A compact summary of the formulæ, taking into account the effect of a range of values, is given by the same author, as follows:

For cast iron (cork) on cast iron:

When W is less than $0.7\,A\,(K - 5.6)$
$R = 0.33\,W$
When W is more than $0.7\,A\,(K - 5.6)$
$R = 0.16\,W + 0.118\,A\,(K - 5.6)$

For bronze (cork) on cast iron:

When W is less than 0.66 A $(K - 5.4)$

$$R = 0.33\ W$$

When W is more than 0.66 A $(K - 5.4)$

$$R = 0.14\ W = 0.126\ A\ (K - 5.4)$$

For cast iron (cork) on steel:

The formulæ will be modified as follows:

$$R = 0.15\ W = 0.124\ A\ (K - 4.5)$$

$$r = 0.15\ w + 0.124\ (K - 4.5)$$

The critical point occurs when $W = 0.62\ A\ (K - 4.5)$ or $w = 0.62\ (K - 4.5)$.

The summary involving a range of values may be taken as follows:

For cast iron (cork) on steel:

When W is less than 0.62 A $(K - 4.5)$

$$R = 0.35\ W$$

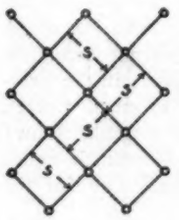
When W is more than 0.62 A $(K - 4.5)$

$$R = 0.15\ W + 0.126\ A\ (K - 4.5)$$

The above work has the sanction of Prof. Ira N. Hollis, also of Harvard, under whose supervision the tests were conducted. The deductions are much more complete and reasonable than usually can be attached to tests of this sort. They apply in this case to a marked degree, because they were conducted with a view to the automobile, whereas the tests generally available are of a nature not taking the automobile into account, or of so abstract a nature as not to directly apply. Prof. Nichols compiled a table for use in spacing cork inserts with a view to fixing upon the percentage of the total surface that the cork inserts should occupy, on a basis of quick and accurate results. The table is given here without modification. As will be observed, the cork inserts are pressed into holes, or sockets.

D = ½"		D = ⅝"	D = ¾"	D = ⅞"	D = 1"
S	K%	K%	K%	K%	K%
1"	19.6%	31.7	44.2	60.	
1⅛"	15.5	24.3	35.	47.5	
1¼"	12.6	19.6	28.3	38.5	50.3
1⅜"	10.4	16.2	23.5	31.9	41.6
1½"	8.7	13.6	19.7	26.7	35.
1⅝"	7.5	11.6	16.8	22.8	29.8
1¾"	6.4	10.	14.5	19.6	25.7
1⅞"	5.6	8.7	12.6	17.2	22.4
2"	4.9	7.7	11.	15.	19.7
2⅛"	4.4	6.8	9.8	13.3	17.4
2¼"	3.9	6.1	8.8	11.9	15.6
2⅜"			7.9	10.7	14.
2½"			7.1	9.6	12.6
2⅝"				8.7	11.4
2¾"				8.	10.4
2⅞"				7.3	9.5
3"				6.7	8.7

John R. Nichols



"COMPO" TESTS
D = DIAM. OF SOCKETS
S = SPACING
K = % OF CORK TO TOTAL AREA

While the opportunity affords, it may be well to mention the fact that a new class of clutch and brake facings is now in use, *i.e.*, facings of asbestos, interwoven in a wire mesh in such a way as to afford the higher resistance of asbestos and the mechanical strength of wire. In a general way, it is quite possible that the action of these facings will be found to be with a critical point. In other words, they will probably be found to act differently under great pressure than will be the case with comparatively little pressure. In a twelve-hour non-stop run of a Chalmers-Detroit "30," over mountain roads, made by the author September 27, 1908, an opportunity was afforded to try out this class of facings on brakes, and it seemed to the author as if the initial friction (per pound of effort) was more pronounced than the later effort.

The results, on the whole, were very satisfactory, and the brakes were just as effective at the end of 240 miles of the hardest kind of work as they were on the start. The ordinary fabric would have given out long before the end of the run, as the author found by an actual run with another car over the same course. The Nichols formula would probably apply to the use of the asbestos products as well as to the cork inserts, subject to a correction of the constants of the formula. In the case of the asbestos (wire mesh) products, the pressure can be applied to an extent such as will compact the fiber enough to engender more nearly the metal to metal conditions than can be possible with the fabrics in which there is no metal binder. It is true, of course, that the percentage of metal will be small, relative to the total surface, but it is true as well that the percentage of cork, if increased beyond certain points, does not evolve a corresponding increase in results. In other words, there is no occasion for having more than a certain percentage of the total surface covered by the cork inserts.

When it comes to leather, red fiber and such materials, there is no compounding of the effect on critical point nor a change in the coefficient of friction before the change in structure due to charring as a result of a greater temperature than the materials will withstand. Wood chars at about 550 degrees C., and bursts into flame at about 600 degrees C. Leather will show effect of heat considerably sooner, and the coefficient of friction will change as soon as the leather suffers any change in character. When leather is subjected to the combined action of pressure and heat it loses its oily condition and becomes "as hard as a board."

In this "crusty" condition leather is no longer suitable for the purpose, because it will no longer act in the same way. The leather will not cling to the same extent, or anything like it, and as a consequence the spring strong enough to do the work with the leather in its most receptive state will be too weak when the leather becomes hard, unyielding and glossed over. Red fiber has the ability of wood (it is wood) as long as it lasts. It does not last long enough, as a rule, in work of an exacting character. Wood has long been used in its natural state for frictions in brakes and clutches, and it seems to be more durable than the fiber. In automobile work wood cannot well be applied, because of the spinning tendency, if the friction member is of any great weight, at a distance from the axis of rotation.

Coefficient of Friction in the Abstract.

It was said the tests given in connection with the cork inserts were at a low speed, such as that due to drawing a flat plate over a smooth surface at a low speed. This coefficient does not, of necessity, show what would follow were the friction members caused to rotate at a high speed. Indeed, there are clutches that will not engage at a high speed, and the motor has to be slowed down. In general, it is conceded that the laws of friction will be different as the materials and the state in which they reside are varied. We have to consider, then, the laws as follows: (*a*) the friction of solids; (*b*) if the solids are unlubricated; (*c*) rolling friction; (*d*) fluid friction; (*e*) intermediate conditions.

Rolling friction may be stated as the force required to slide one body over a relating body, between which bodies rollers or spheres are interposed, in some cases to reduce the friction of rolling and in other instances to the detriment of the process, if, in the latter case, the resistance is desired on a basis of the maximum.

In ball-bearing work, the absence of friction is the quantity desired, whereas in clutch work the friction is sought. In clutch work, oil interposes a slippery surface and the coefficient of friction of the oil is the result. Oil then is not as a roller.

Sand or other hard foreign substances might be regarded as having the properties of rollers. A bearing (ball) in thrust might be as a friction member if the thrust is high enough to pinch the balls into wedge-shaped grooves. The law of rolling friction was well set forth by Henry Hess in a paper before the Society of Automobile Engineers, at the summer meeting of 1907, in Buffalo. This question will be of no further profit here because clutches are not as yet built of ball bearings in thrust to such an extent as to engender enough friction to enable them to perform the clutching function.

Friction of Rest.—The force required to start a body sliding is called the friction of rest (Kent). This phenomenon requires a little elucidation in order that it will be the better understood. When a member is at rest, the oil is squeezed out (because of the time allowed) and solid friction is the result. The friction of rest, then, is substantially "solid friction," and instantly the body is caused to rotate oil is picked up and thrust into the space, with the result that the friction of the slippery surface is the phenomenon to be noted. In the one case the coefficient of friction is that of solids on solids, and in the other instance it is the coefficient of friction of the lubricant.

The Friction of Solids.—(*a*) If the solids are of a fibrous nature the friction will probably decrease as the pressure increases. The friction will also decrease with increasing speed. The cork insert illustrates this set of conditions adequately, in that increasing pressure results in a critical point if the pressure is increased enough to bring about metal to metal contact. The curve of friction is maintained (as the formulæ show) because, as the friction of the cork tends to diminish under pressure, the friction of the metal to metal makes up for the deficit.

(*b*) The friction of non-fibrous materials will be proportional to the pressure only (within the limits of abrasion). Here, again, is evidence of the fact that a soft, yielding mass is of considerable advantage, if the mass is backed up in such a way as to allow of solid friction at the higher pressures. The reason for this lies in the fact that the soft yielding mass will afford the maximum resistance at the lower pressures and speeds, while the later metal to metal contact will introduce the increasing resistance with increasing pressures and speeds.

(*c*) Increasing hardness is attended with decreasing resistance. This is adequately illustrated in leather facings when they become charred and glossy. Hardened steel discs also act in the same way. The spring pressure in a clutch will have to be greater for hardened steel on steel than it will have to be for bronze on steel or bronze on cast iron.

(*d*) The limit of abrasion is the limit of ability in clutch work at any rate, and this limit will increase with the hardness and toughness of the materials in contact. Hardened steel on steel, then, possesses the virtue of a high limit of abrasion, and can well sustain high pressures.

(*e*) If the surfaces are lubricated, it is the friction of the lubricant that must be taken into account up to the time the pressure is high enough to expel the lubricant.

Unlubricated Solid Friction.—The behavior of unlubricated solids, caused to slide upon each other, is such as to render the mistakes of designers fully accounted for. They sometimes use the coefficient of friction, as determined at a low speed, assuming that it will represent the friction that will obtain at a high speed. On the contrary, the unlubricated friction will decrease with increasing speeds, at first rapidly, thereafter less rapidly, and ultimately follow no man's law; in practice, at any rate. To be safe is to allow for a fall in the coefficient of friction in clutch work wherein the lower friction is a detriment, since friction is what is wanted. It is a well understood fact that bearings, for illustrations, run easier at higher speeds than they do at low speeds. This is true if they are lubricated or if they are not, up to a certain point.

Fluid Friction.—This is a phenomenon that should receive some consideration in clutch work because of the drag of the clutch, due to the fluid friction, in the class of clutches of the disc type in which the discs are submerged in oil. Fluid friction has recognized characteristics, as follows:

(*a*) The friction is in direct proportion to the wetted surfaces, hence in direct proportion to number of discs in clutch.

(*b*) So long as the oil stays between the plates (discs) the fluid friction is independent of the pressure.

(*c*) The friction is proportional to the square of the relative velocities at the higher speeds. The drag of the clutch will then increase enormously with the speed of the motor.

(*d*) If the speed is low, the friction will be proportional to the velocity.

(*e*) The friction will not be influenced by the generic nature of the metals in contact. This is to say, as long as it is fluid friction it matters not of what metal the discs may be.

(*f*) The degree of smoothness will have some bearing, but clutch discs are never rough enough to have any influence on the friction of the fluid. Were they put in rough they would promptly wear smooth.

(*g*) The resistance (drag of the clutch) will be proportional to the density of the fluid (oil), and the viscosity of the fluid will also have a bearing on the performance.

(*h*) The unctuousness of the fluid will have bearing upon the performance of the clutch, as is adequately proven from the fact that light grades of cylinder oil will not act well until they are charged with their own weight, approximately, of kerosene. The unctuousness of kerosene is almost a minus quantity, while the light cylinder oil is of a high value.

(*i*) The mobility of the oil has a considerable bearing on the performance of the clutch from the point of view of drag. If the oil falls off in density as the temperature increases, it is a mobile product and not so desirable for a clutch, for the reason that the density of the oil will be very marked when the temperature is very low, as it would be in winter.

Some Coefficients of Friction.

Leather: (Gen. Morin).

(*a*) On clean, dry, smooth metal	0.56
(*b*) On wet metal	0.36
(*c*) On greasy metal	0.23
(*d*) On oily metal	0.15
*(*e*) Dry, compressed, charred leather; on greasy, polished metal	0.08

***The effect of compressing and of the dry polished surface is a condition peculiar to the automobile clutch.**

As will be observed, leather furnishes all the conditions between the most satisfactory possible, when it is new and well applied, to the most abject failure, from the clutch point of view. No motorist of experience has escaped the two extremes.

The question of the applied pressure is one that probably belongs to lever systems, in so far as the several modes of application are concerned. In the main, however, it does not seem desirable to separate the subjects. The foot pressure should not be so little as to render it impossible to use the pedal as a foot rest. On the other hand, the pressure should not be so great as to make it tiresome to press the pedal and hold it down. Forty pounds should be about the right pressure, with the clutch open and the initial pressure should, and would, be less.

(To be continued)

THIS IS WONDERFUL, IF IT IS TRUE.

This description is from a Chicago daily paper. It is doubtful if even the maker of the car could recognize it: "The transmission is on the floating type rear axle, and a drop frame is used, with herringbone gears for quietness. There is an 18-inch steering wheel, the ball-bearing knuckle making it exceedingly easy to steer. There is a fan on the flywheel and four brakes. We use the three-point motor suspension, aluminum hoods and fenders and geared lubricator. The body is of hand-hammered aluminum and there is seating capacity for six people. This gives a car without noise, jar or vibration and with speeds of from five to fifty miles on the high gear."

LETTERS INTERESTING AND INSTRUCTIVE

EXCESSIVE FUEL AND OIL CONSUMPTION.

Editor THE AUTOMOBILE:

[1,591.]—Your department of "Letters Interesting and Instructive" leads me to write the following: I have an eighteen-horsepower runabout with rumble seat, equipped with a Schebler carbureter and a ten-gallon gasoline tank. There is absolutely nothing wrong with the running of the car, but the amount of lubricating oil and of gasoline used seems to me rather excessive. On last Saturday I made a demonstrating trial over a known course of twenty miles. At the end of the run I had used one quart and one pint of lubricating oil. Turning round, I made the run directly back to the starting place, a second twenty miles, and at the end of this I had again used a full quart and pint of oil. In noting the smoke from the exhaust at all times during the run, there was no excess of this oil being burned in the cylinders; the engine at no time misfired, until at the end of about fifteen miles, when the spark plug of the right-hand cylinder was found to be badly sooted. After changing the plug the balance of the run of twenty-five miles was made with no trouble whatever.

During the trip of forty miles six gallons of gasoline were consumed, and yet at no time was there a single misfire in the exhaust or puffing in the carbureter, giving any indication of either too rich or too weak mixture. There is one fact that seems hard to explain, and that is that the oil thrown off by the flywheel forces itself through the hinges and openings of the hood and along the openings between the hood and the frame.

Can you give me any information that will prove of value in a case like this? W. L. H.

Rockville Center, L. I.

The sooted spark plug indicates a slight excess of oil fed to the cylinders, but the principal loss is evidently by leakage, as shown by the oil forcing itself through the joints in the hood. The place for oil is inside the engine, not outside, and when it begins to appear on the hood or to drip from underneath when the car is standing still, it is a safe indication that there is something wrong. The principal source of loss will probably be found to be around the bearings of the crankshaft and the gear-case. Some sort of oil-retaining device ought to be fitted on all such bearings, and these may require cleaning or fresh packing. If the car has been in use long, the bearings themselves may be worn, and require adjustment or even replacement. In case the makers have neglected to provide for any oil-retainer in the design, and it is found impossible to make the bearings tight with proper adjustment, you may be able to fit some device yourself to serve the purpose.

Your gasoline consumption of a gallon for every 6 2-3 miles is certainly unreasonable for such a light car, and it seems impossible that that amount could be passing through the cylinders without giving some unpleasant indication of its presence. We would suggest that you verify the measurements carefully, making sure that no gasoline is drawn from the tank for cleaning or other purposes during the test, and that there are no leaks.

DO AUTOISTS LIKE TO BE COMFORTABLE?

Editor THE AUTOMOBILE:

[1,592.]—Can you give me information about the public or owners of large automobiles? Are they looking for more comfort as to their feet? Say, for instance, riding for a few hours or a whole day cramped up in the car you would like to rest your feet or change your position. From sitting to a lying-down position would greatly change the monotony. Do you think a foot rest would be in demand that would not take any room from the car, only when in use? I have an article that I want to bring before the public, which I want to patent, but am a little backward. Can you give me any encouragement? J. P. HOPPA.

Milwaukee, Wis.

We have no doubt that the automobiling public in general would gladly welcome any device which would increase their comfort, provided the price were no more than commensurate with the increased enjoyment. But there are already a number of foot rests on the market which fold up when not in use, and many cars next year will include them in their regular equipment. The lying down device, however, hardly seems likely to increase the comfort of traveling over ordinary roads.

SOME QUERIES ABOUT THE TRANSMISSION.

Editor THE AUTOMOBILE:

[1,593.]—I would like to ask you several questions and would be much obliged to you for answering them:

1. How is the transmission employed on the Cameron car constructed, and how does it work?

2. Could you tell me what advances have been made toward eliminating the differential gear? What devices have proved successful?

3. Would you explain the construction and operation of a gas turbine? Are there any you may know of that could be seen in operation? A. M. W.

New York City.

1. The change-speed gear-set (popularly misnamed the "transmission," which properly includes the entire drive from the motor to the rear wheels) of the Cameron car consists of a single short shaft carrying three spur gears, to give the three forward speeds, and the large driving bevel. This large bevel meshes with the bevel pinion on the end of the propeller shaft, as is customary. The short shaft in question is placed transversely, or parallel to the rear axle, and is carried on a heavy yoke that may be rocked up and down, a large spur gear being bolted to the case of the differential. The entire gear-set, bevel drive and differential, are contained in one small housing at the rear axle. In order to obtain any one of the forward speeds, the pinions in question are shifted along the short shaft mentioned, until the one representing the speed desired is exactly opposite the large spur gear on the differential. The shaft is then rocked downward, engaging the two gears face to face, and is locked in place, the entire operation being accomplished by a simple movement of the side lever. To go from one speed to another the lever is manipulated in the same manner, the operation consisting of unlocking the speed then in, shifting the shaft forward out of engagement, sliding the new pinion into line and again locking the gears together—something that sounds complicated in a description, but is quite the reverse in practice. The great advantage of this gear-set is that the pinions are engaged face to face, making no side contact, as in the ordinary form of sliding gear. The reverse is obtained by an intermediate pinion that is only thrown into engagement for this purpose. In coasting with the gears in neutral, the rear axle turns entirely free, and if the clutch is out, the propeller shaft and all the gears are idle as well.

2. There have been a great many attempts to eliminate the differential, but so far as our knowledge goes, the only one that has actually survived and been applied to any extent, is known as the Hedgeland axle, which is an American invention and is made in this country. Its principle is that of permitting the outer wheel, which has the greater distance to cover in traversing a curve, to run free, or ahead of the inner wheel, which, for the time being, transmits all the power.

3. To our knowledge the only gas turbines in actual operation are in use in France. The principle consists of the utilization of the pressure generated by burning a mixture of gas and air in a retort, against the blades of the turbine rotor in much the same manner as steam is employed, the modifications necessary being those required to handle the gases at the extremely high temperatures involved. A detailed description of this turbine may be found in *Cassier's Magazine* for January, 1907.

POSSIBLE CAUSE OF CARBURETER POPPING.

Editor THE AUTOMOBILE:

[1,594.]—In regard to letter No. 1,578 in the issue of October 8, Mr. Hutchings may find that his trouble is due to scale of metallic hardness having been formed on the valve stems and their bearings. In starting the engine under this condition, the camshaft speed is so low that the full force of the valve springs cannot be used to seat the valves, thereby allowing them to stick by reason of the scale. At a higher speed, however, the cams get from under the valve stems quickly enough to allow the seating of the valves in spite of the scale. The popping in the carbureter

would thus be due to leaky inlet valves. To remedy this, remove the valves and scrape off the scale, both from the valve stems and from their bushings. I think this will remedy the trouble.

Ithaca, N. Y. CHARLES E. YATES.

We do not quite follow your reasoning with respect to the full force of the valve springs not being available to seat them. It is evident that the springs exert the same force irrespective of the speed of the camshaft. If the valve stems really were sticking, the missing or popping would be more likely to occur at high speeds than when running slowly, owing to the valve not having sufficient time to return to its seat. In fact, we think that if Mr. Hutchings has not already discovered the source of his trouble, he would do well to make sure that the inlet valve stems are not too loose, as leakage of air through the guides on the suction stroke would have the effect he described.

MORE ABOUT PERCENTAGE OF DIFFERENCE.

Editor THE AUTOMOBILE:

[1,595.]—I am sorry we still disagree, but since you say I have side-stepped the question I will try to return to it. We began talking about the vibration of a single-cylinder motor of a given power and comparing it with motors of like power and more cylinders. I explained that two cylinders would give impulses of half the power and twice as often, so that the vibration effect would be but one-fourth that of the single cylinder. Likewise that three cylinders gave impulses of one-third the power and three times as often with one-ninth the vibratory effect, while four cylinders gave one-sixteenth the vibratory effect given by the single cylinder of the same power. So the fractions refer not to each other, but to that single-cylinder impulse with which we started.

In the wooly West where I went to school, every fraction presupposed a unit. And that unit had one hundred per cent., nine ninths and sixteen sixteenths. It is preposterous to assume one of the three fractions used as the unit base of comparisons. But if this is to be done, why select the one-ninth? The one-fourth mentioned is larger and more important. Or why not the one-sixteenth? The use of this as a unit or base for comparison would give a percentage difference of 78. But everybody knows that the multiplication of cylinders rapidly reduces the vibration, and it would be the height of absurdity to tell a user that there is 78 per cent. difference between cars of two and four cylinders in the matter of vibration, for his own feelings tell him more reliably. Your answer to C. W. M. rightly indicates very little difference. My thanks to "Cincinnati." His brand of arithmetic is all right.

I pride myself that in my arithmetic, as in other matters, I try to stick to the plainest English of which I am capable, and I am disappointed that I did not make it clear that the public had been offered side-entrance surreys for years before the rear-entrance French freak ever was seen. They were offered wood wheels before they bought wire ones. They were offered gasoline rigs that ran before they swallowed the dinky steam toys and sickened so badly on steam that the really fine steamers now on the market are regarded with suspicion. Magneto ignition was an accomplished fact in America ten years ago, but the public are really just beginning to find it out. And the list can be extended much farther.

The side door is an imported nuisance. It was designed to shut the high-born lady in from the vulgar crowd, and will always be used by those who think they must be exclusive, but watch the growth of the practical surrey without the doors. Of course the doors serve a useful purpose in that the tires and repairs so frequently piled in the rear can not fall out, but rigs are getting better every year, so this need is passing. The enclosed box stall is a good dust receptacle, and this alone is enough to condemn it. In properly designed rigs the rear seat can ride nearly as easily as the front and with no more need of doors to keep the riders from falling out. I again say that on subjects new to it the public opinion is usually wrong. Watch the light car with light motor displace the heavy one. CHAS. E. DURYEA.

Reading, Pa.

We are glad that you have again stated the subject of the discussion, as it had dropped completely out of sight. In comparing the vibration of a three and a four cylinder motor, if the vibration is assumed to be in the proportion of one-ninth to one-sixteenth, there is a difference of 43.78 per cent. between the two. We have already demonstrated the way in which this result is obtained, and if you have any doubts as to its correctness you had better consult some fourth or fifth year school arithmetic. But we do not admit the correctness of your method of stating the proportionate vibration. Assuming that it is correct for the cylinders alone, which is doubtful, you make no allowance at all for the flywheel. Of course it would be preposterous to say that there is 78 per cent. difference between the vibration of a two-cylinder and a four-cylinder motor, no matter what brand of arithmetic was used, because all such motors have a flywheel of suitable size. The vibration of a motor depends on many things besides the number of its cylinders.

As to the poor, much-abused public, it may have shown its wisdom in some of the very cases you mention, by buying cars in which the quality of the material and workmanship was not subordinated to a few talking points. And side doors will keep out a good many cold drafts this winter.

A PLEA FOR SIMPLIFYING AND STANDARDIZING.

Editor THE AUTOMOBILE:

[1,596.]—In all the hill-climbing contests which have come under my notice the engine ratings have been based on the piston displacement, and invariably the volume is expressed in cubic inches.

This is one of the mathematical absurdities that have descended through generations and have produced mental habits hard to break. Always we think of volumes as having rectangular boundary lines, and we must convert all forms, however regular and common they may be, to the cubic form before comparing them.

So also we think of surfaces and sections as squares, hence our units of area are always square, and we go on converting the value of circles and cylinders and spheres into terms of squares and cubes, for each equation, requiring the use of a long decimal multiplier or divider, wearing out gray matter, better devoted to more useful service.

When we get away from this worship of the rectangular god, we are free to set up a new and more convenient rule for comparing volumes and areas, viz.:

When volumes or areas of like form are to be compared with each other, the unit of measurement should be of the same form.

The electrical people have adopted the "circular mil" as the unit of sectional area for wire, etc., which is much more convenient than a square mil, for it requires only that the diameter in .001 inch be multiplied by itself to give the sectional area, and the diameter in .001 inch of a wire of any desired area expressed in circular mills is the square root of the area.

d^2 = area, is a much shorter equation than d^3, 7854 = area, or nR^2 = area, and for purposes of comparison a much better one.

Why should not the engine builders and users adopt the cylindrical inch as the unit of piston displacement and cylinder capacity. Then the equation for displacement would be d^2L = volume, the proportion would remain the same as if reduced to cubic inches.

Thus the displacement of a cylinder 4" diameter with 6" stroke = 96 cylindrical inches or 75.3984 cubic inches.

The displacement of a 6" cylinder with 4" stroke = 144 cylindrical inches or 113.0976 cubic inches.

96:144::75.3984:113.0976. You see, it is just the same, and if you took your choice without prejudice you would take the shorter one expressed in whole numbers.

It is as easy to convert the volume of irregular cavities such as the compression space into cylindrical units as cubic units, the ratio between them being of course 1 to .7854.

The sectional area and volume of intake and exhaust pipes, the area of any circular opening such as valve ports could bets be expressed in circular and cylindrical inches.

Simple and easy understood methods of comparing one engine with another would be a boon to the automobile user, who is not always an engineer; neither has he a slide rule with him all the time, but he could readily multiply the diameter by itself and that product by the length of stroke. The calculation usually involves whole numbers or simple fractions, and could be done mentally.

There should also be a standard of speed at which an engine is rated, or rather there should be two points at which a variable speed engine such as used in an automobile should be rated.

Various compressions and valve timing may give an engine a high power at high speeds at the sacrifice of power at low speed, and vice versa; so it is hardly fair to compare two engines of the same bore and stroke at only one speed. Hence a rating should be given at a point between 400 and 600 r.p.m. (the normal running speed) and between 1,200 and 1,600 r.p.m. (the point of greatest output).

The power curve in most engines rated at from 30 to 50 horsepower is a rising one up to from 1,200 to 1,600 r.p.m. At some point in this range, the inertia and other losses which are rapidly rising compensate any increased power due to speed, the curve flattens out and shortly begins to drop.

Why not establish these extreme points in some engineers' convention as a standard of speed for power rating, publish it widely, and thus "put a crimp" in the practice of trading in ambiguities and fairy tales. FREDERICK PURDY.

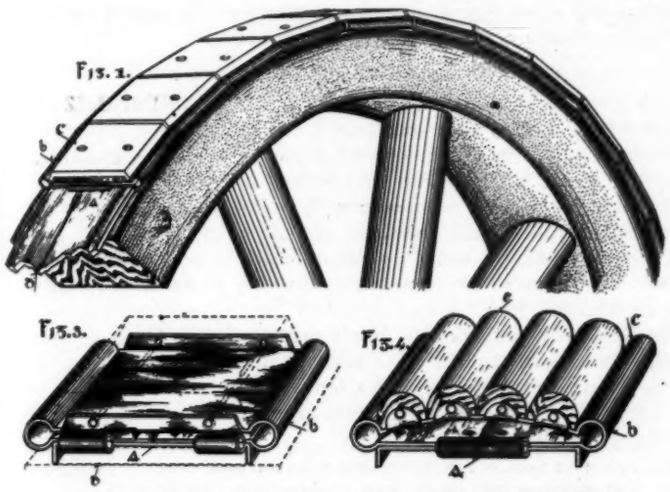
New York City.

SECTION SPRING WHEEL FOR POWER VEHICLES.

Editor THE AUTOMOBILE:

[1,597.]—I have designed a new tire for heavy commercial vehicles, and I wish to submit it to your judgment for criticism. I am fully aware of the great virtues of the pneumatic tire, and am not foolishly attempting any improvement in that direction. The pneumatic tire cannot be even approached. It is peerless, and the pure gold of the tire industry.

My tire is especially intended to supplant the solid tire of pure rubber. I think it will give just as good service, last much longer,



From the Patent Drawings of Mr. O'Meara's New Tire.

and cost less. The solid tire of pure rubber gives fair service under great loads while it lasts, but its life is indeed short under an unmerciful load, whether it be a continuous or a sectional construction. My aim is to design a mechanically constructed tire that will afford some resiliency. Something that will hold fast to the periphery of the wheel of a truck making 20 miles an hour.

Accompanying my letter you will find a sketch of the tire in reference, also a photograph of a model. In the sketch is shown a continuous chain of double flat metallic springs, shod with blocks of oak, secured thereto with wire nails, and forming an annular series of spring sections removably secured to the felloe of an ordinary artillery wheel. These sections can be removed individually, and may be secured to all compression spoke wheels of ordinary construction without alteration. It is a formidable spring, and when properly designed and mounted cannot be disturbed. It is extremely low, and because of its form can be easily secured to the wheel and becomes a part thereof. It is a truss in itself, of immense resistance for its weight, and effectually unites even a high section of wood to the wheel. It is formed of sheet steel, and, being without guides, pivots, sockets, etc., which cause friction and trouble, it is noiseless.

It is extremely hard to get anything in a sectional type of tire that will stay fast on a power-driven wheel. Yet I believe that the long-looked-for mechanical tire will be sectional. Some who have had experience in spring wheels have finally come to the conclusion that a plain block of wood is the only thing that can stay on a wheel. But a plate is necessary, and the spring shown on the wheel being, properly considered, a cushion plate, a section of wood mounted thereon, is even better secured than when attached directly to the rigid felloe of kindred material, because the spring in question, having a slight yield and a slight swaying lateral motion, will neutralize the most severe shocks, while the sections will sustain any weight that the wheel can.

The design of spring shown in Fig. 4 is capable of considerable yield, and it must be shod with two or more sections instead of one single block. The circular sides will not shear. They will bear many times the weight that the spring can at the center, and, not being rigid, they will neither rock the spring nor collapse. These spring sections should be diagonal and rest diagonally on the wheel, thus allowing two or more sections to touch the road at once and offer as many independent yielding surfaces, besides giving the wheel better traction and ability to shed dirt.

The importance of successfully covering this type of tire is greater than any other consideration. These springs must be water-tight. The model that I have made is covered with sheepskin. This model is intended for lighter vehicles than motor trucks. The covering is a continuous plain piece of leather drawn over the springs, which are too close to present any edges to be feared. The wood portions are twin supplementary rims adjusted from either side. I do not fully approve of all the details in the construction of the very wheels shown, but my principal object is to prove the adaptability of this spring as the germ of a spring wheel when shod with a block of wood or more suitable material. The cushion plate and the block of wood are both practical. I believe it to be the only spring that can be possibly considered for the purpose. These are my own reflections. Now, may I ask what are yours?

DENIS H. O'MEARA.

Hamilton, O.

PISTONS, MAGNETOS AND STORAGE BATTERIES.

Editor THE AUTOMOBILE:

[1,598.]—What is the process for figuring the diameter of piston rings for any size pistons? What is the composition of the cement used for celluloid storage battery cases? How may the armature of a magneto be tested for a ruptured wire? What is the probable trouble with a high-tension magneto when it delivers a feeble spark direct, and the magnets seem very strong—magneto perfectly clean? How many thousandths of an inch smaller should the piston be than the cylinder?

L. T. S.

It is impossible to give any formula offhand for the diameters of pistons or piston rings, and even if it were, such formulæ would be of very little practical use. The smallness of the quantities involved makes accurate figuring useless, as it soon exceeds the limit of accuracy of the tools. Most engineers go entirely by "rule of thumb." A good cement for celluloid is composed as follows: 25 parts shellac, 25 parts spirits of camphor, 100 parts 90 per cent. alcohol; apply warm. Another consists of fine celluloid shavings dissolved in 90 per cent. alcohol. The best way to test your magneto armature for a ruptured wire would be to substitute a new armature known to be in good condition, and observe the results. A magneto is a very delicate thing to experiment with, and when any trouble arises that cannot be cured by cleaning and adjusting the contacts, the best course is to ship it back to the factory immediately.

REFINISHING THE STEERING COLUMN.

Editor THE AUTOMOBILE:

[1,599.]—The steering column of my automobile is of steel tubing and is brass plated. The plating has worn off so much that the post rusts, and this is difficult to remove. Does "The Automobile" know of any paint I could use to cover the column, and must this be specially applied? Or would an enamel be of service?

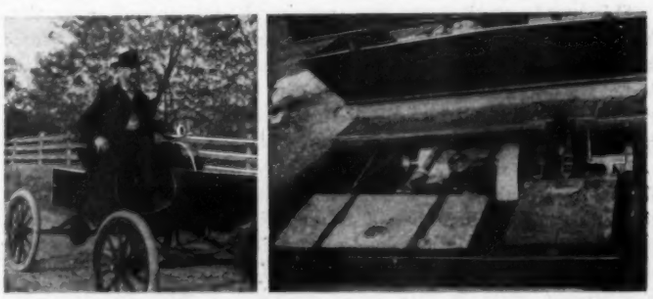
Milwaukee, Wis. A. S. H.

Many cars now have the steering column, as well as the levers and the radiator, painted to match the body work of the car, and this practice seems an improvement from every standpoint. No special paint is necessary. Enamel might serve the purpose.

INSTALLING 10-H. P. MOTOR IN AN OLD MODEL.

Editor THE AUTOMOBILE:

[1,600.]—Some time ago I promised to let you know the result of an attempt to install a two-cylinder 10-horsepower motor in a curved-dash Olds runabout 1903 model. It certainly was a decided success, and A. H. Phelps, a mechanical engineer, who owns the car, now has a fine working little runabout. Though this is a very mountainous country, the car takes some very stiff grades on high with perfect ease, and can make about 30 miles an hour on the level. Mr. Phelps did the job of making the change himself.



Mr. Phelps in His Reconstructed Olds. Showing How the New Power Plant Was Neatly Installed.

By having a transmission shaft made to bolt to the flywheel, he used the old transmission, and by making some slight changes he also used the old levers and connections. The two photographs which I send for illustrations show the complete car with Mr. Phelps at the lever, and the other shows where the engine is located in the chassis.

E. R. WELLS.

Keene Valley, N. Y.

CONCERNING THE SILENT KNIGHT MOTOR

By THOS. J. FAY.

THE invasion of Europe by Americans and American devices is nothing new. The Silent Knight motor takes rank among the invaders, although it cannot be said the same motor cut much of a swath in America during the time of its trial here. The reasons why this motor failed to win a place for itself during the time of its sojourn in America, beginning some six years ago, could be traced to environment more than to the failure on the part of the motor to perform.

Had the motor been well constructed and properly applied, it probably would have failed to make its mark at that time, because the period was one devoted for the most part to the types of motors as they then emanated from the factories of France and Germany. At that time cars were strictly luxuries and the fad was for a foreign "Red Devil."

That the Silent Knight motor failed to impress the designers in America (not to mention users of cars), is an assured fact, and it is now that we learn of the taking up of this motor by the Daimler company and by the Minerva people also.

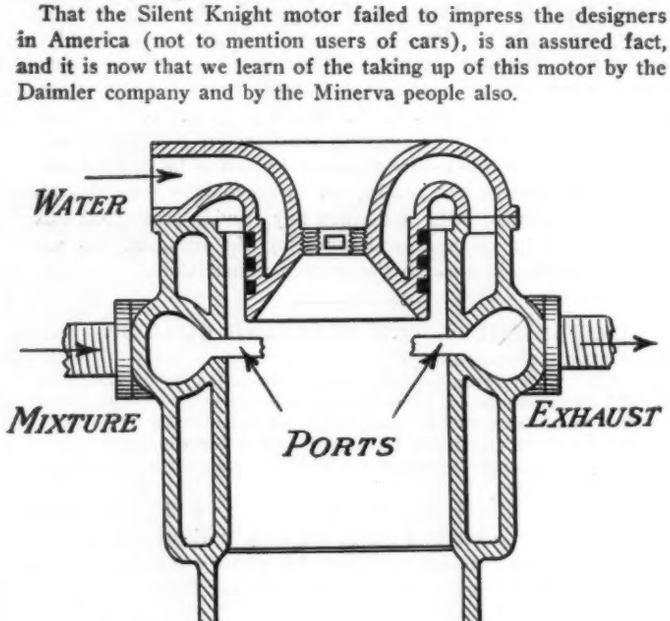


Fig. 1.—Cross-section of a Silent Knight Cylinder.

At all events, the motor in question is now being exploited by the Daimler company, and it is reported generally that they have abandoned the conventional four-cylinder motor—on which they always placed such great reliance—and more completely offer the advantages of the new motor in their future cars.

This motor as they are now turning it out, according to the latest devices, differs only in minor particulars from the same motor, as we (in America) were accustomed to know it first some six years ago. Presumably, the new product will reflect the advances in modes of construction and in the quality of materials entering into the respective parts.

It would be untimely to say much by way of bragging about the Silent Knight as an American product by an American, now that it has to be transplanted to make it grow. While we were chasing the rainbow, by way of foreign designs, to the utter neglect of "nuggets" lying under our feet, we were paving the way to our more or less future undoing, if what the Daimler company says is true.

If the "beggar" proves to be rich, it will cause us a pang or two, and, having thus ruthlessly driven him away from our door, we will have small claim to the future glory that naturally gravitates towards merit. If, on the other hand, the Silent Knight motor fails to keep step with the claims now being made for it, we may pat ourselves on the back and flatter ourselves that we know a ripe watermelon when we see it.

This motor in relation to which our English cousins are now making such a stir about will be remembered as one of the class formerly said to be valveless. The appellation "valveless" was a misnomer, on the ground that the motor has more valves about it than any other type of motor yet offered to the patient public, but the valves are not of the "poppet" genera.

Appellation "Valveless" Is a Misnomer.

The valves in the motor in question are of the well-known piston type, as they have long been known in steam engineering. True, the valves in this motor are not located in a valve-chamber, as they are in steam engines, but instead the valves are by way of concentric sleeves, concentric with the piston proper. There are two of these valve sleeves, one of which is next to the piston of the motor, and the other of which is next the cylinder wall. The valve so constituted is actuated by means of a linkage to an eccentric (one for each cylinder), just as in steam engines. The admission and exhaust ports are properly located in the respective sleeves and in the cylinder wall, in such a way as to afford the functions requisite to a four-cycle motor.

The whole arrangement is such as to afford timing of the openings as follows:

1. The inlet port opens before the exhaust port closes.
2. The exhaust port is covered by the outer sleeve.
3. On the inlet side the port is at full open, since the slot in the inner and the outer sleeves are in juxtaposition.
4. The inlet port is still open at the beginning of the compression stroke.
5. The inlet closes before the compression exceeds the inertia component of the incoming mixture.
6. All ports remain closed during the completion of the compression stroke.
7. Ignition is with all ports closed.
8. Expansion of the charge with all parts closed.
9. Exhaust ports begin opening just before the end of the expansion stroke.
10. Exhaust ports wide open when the pistons reach lower dead center.
11. Exhaust port remains open until beginning of suction stroke and until the inlet port opens. (See Fig. 1.)

With valve timing such as would satisfy the conditions of operation of a conventional (poppet valve) motor. The time of escape of the exhaust is quite as long as would be the case with the conventional motor, and the incoming mixture is afforded the same time as in the conventional motor.

In these relations, then, the Knight motor would be quite up to the usual expectations, were a conventional motor in the mind's eye. On the other hand, the conditions would be no better.

Actual Gas Velocity May Be More.

There is a chance that the actual gas velocity will be more in the Knight motor for a given flow of gas on cubic inches, since the piston valves have to slide to a full opening; whereas, the poppet valves raise to full opening on all edges at the same instant and quickly, due to the shape and angular velocity of the cams placed to actuate the valve tappets.

As regards leakage, there is this to say. The poppet valves are usually tight and more to the point; any novice can render them tight if they become leaky. The Knight concentric sleeves are within the cylinders (out of sight), subjected to the temperatures prevailing and stressed by pressure of the piston in each cylinder.

Cylinders go out of round as a consequence of variations in pressure and of temperature, even if they are symmetrical in shape and of even texture. If they are symmetrical in shape it cannot be said of them that they are of even texture, and at best there will be three remaining conditions tending to make them go out of round.

If the cylinders do deform (and they do), the sleeves within the cylinders must deform also, or, what is worse, stick. If the sleeves resist deformation, they will cause oiling troubles, and

noise will be one of the products. The facilities for oiling are by the splash system, and it is not quite apparent as to how the oil will provide a slippery coat over all surfaces on both sides of the two sleeves and on the rubbing surface of the pistons as well.

Some of the surfaces are quite well concealed, and oil will be resisted in its search for a dry surface to cling to, especially

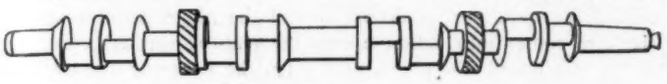


Fig. 2.—Complicated Shaft Required to Operate the Sleeves.

since the conditions are such that the oil must reach its place of lodgment in short time, or be sucked out again, ere it has a chance to reach its goal. Oiling troubles then would be more prone to attach to this type of motor.

Referring to Fig. 1, it is to note that the cylinder head is separable and that it protrudes down into the cylinder for some distance. It is water-jacketed, to be sure, but, as far back as twelve years ago, it was found (when this scheme was tried) that the water ports served as lodgments for foreign substance from the water and that it was best to eliminate the separable water jacketed head on that acount.

Claims Advantage for Separable Head.

The Daimler company claims there is an advantage in having a separable head, although they fail to call attention to the fact that the construction compels them to have it. Be this as it may, the separable water-jacketed head will be cooled by the water, if the same is not shunted away from the head by lodgments of foreign substances.

It has been found that holding bolts for separable heads are wont to stretch for two reasons; i. e., (*a*) because of the tension, and (*b*) because of the heat changes. These disadvantages are more than a theory without a practice to support it, and it was largely on this account that automobile builders expended thousands of dollars in devising and building special boring machines to finish cylinders with a blind end.

As will be observed, by again referring to Fig. 1, the head is provided with packing rings, in order to pack against the inner shell of the valve system. These rings are made in the same way as piston (bull) rings, and should work just as well, barring one circumstance. If piston rings stick in the slots provided to nest them, they fail to serve their purpose, and they will stick if they are not lubricated, or if they soot up. They are kept from sooting up by the movement of the piston, but, in the case of the rings for the head, they do not move, and they will soot up, and, as a consequence, they will not remain tight. If they do not, it seems a waste of space to say what will happen. If we take into account the ill effect of so small a leak in a cylinder, such as follows if a spark plug is not snug, this small leak, in comparison with the leak around packing rings if they do not nest properly, is as a pea to a plum.

Knight Has a Pretentious Eccentric Shaft.

The Knight motor has a very pretentious eccentric shaft, as will be observed by inspecting Fig. 2; a shaft, in fact, that takes on the characteristics of a crankshaft, and there are none of us who feel called upon to hanker after a collection of crankshafts in any automobile we ourselves have to pay for, drive, or keep in good repair.

This is not to say that the Knight eccentric shaft will fail to work, but it is to say that there can be no valid claim of superiority over a conventional camshaft of fair design and construction. In a steam engine, every engineer knows that the eccentric is very prone to run hot. Why should the eccentric behave any better because its geographical position is somewhat altered?

The reports of the Knight motor include a statement that the compression can be increased on the ground of superior cooling and because the poppet valves are eliminated. It is said, nevertheless, that the Daimler company will stick to the conventional compression (about 80 pounds per square inch), but it will be well to give this matter a moment's thought, for fear the claim of advantage by way of increased compression may be with the idea of concealing the facts in the case. In the first place, the cylinder head is no better provided with a water-jacket than is the case with motors of the conventional sort; indeed, it is possible to see how the reverse might be true, as before intimated. In the second place, the piston is not water-jacketed, and it is the piston that does the mischief in all motors, because a zone on the piston head reaches the highest temperature in all cases. In the third place, the cylinder walls in the Knight motor are not nearly so well protected by water-jacketing as are the walls in motors of the conventional sort, because the concentric valve shells intervene.

It is a well-known fact that two parts of metal in contact with each other will not transmit heat nearly so well as a solid wall of the same combined thickness. It will not be necessary to dig up proof of this contention, because every schoolboy knows it. In this case the conditions are even worse, in that the concentric shells must reciprocate and must have a bearing fit inside of cylinders that expand from 15/100 to 30/1000 of an inch, so that there must be an actual clearance equal to from 15 to 30 thicknesses of the oil film to prevent sticking of the members due to expansion from heat changes.

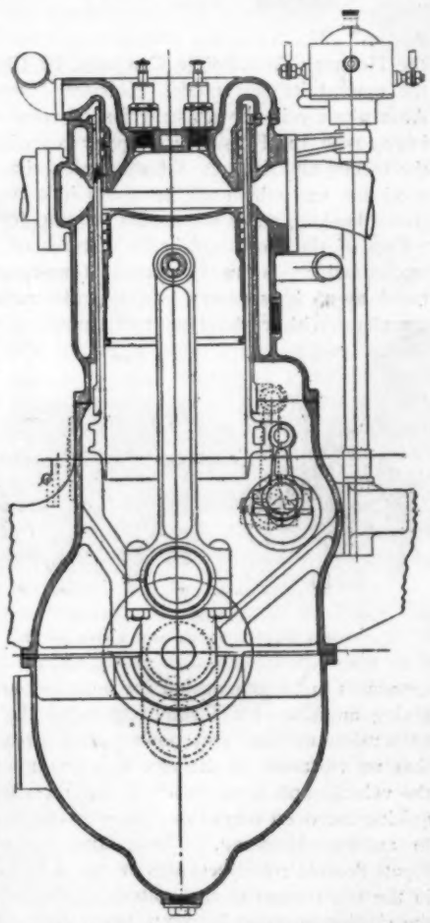


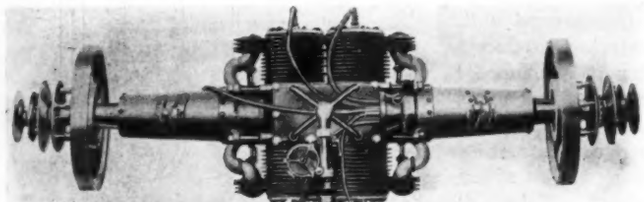
Fig. 3.—Cross-section Silent Knight Motor.

It has been pointed out that the valve system in the Knight motor, instead of the valveless product as originally claimed, is complex and extensive. From this point of view then, there is not a whit of simplicity. Take the question of packing rings. In a conventional motor the packing rings are limited to the pistons, while in the Knight motor there are two sets of these rings. The second set, as before stated, packs the separable head as it bears against the inner shell of the valve system. (See Fig. 3.) In this we see no migration towards the goal of simplicity, and in this we are dealing with packing rings, long regarded as fragile and prone to fail in service. Let us have another look at Fig. 2, and while thus devoting our time, remember that the double linkage required to actuate the two shells of the valve system is something to ponder over.

Dry batteries become inefficient in time, if they are near any source of heat. In such cases, to drill a hole in the sealing compound and spill some water in through the hole is a simple expedient. Seal up the hole, to prevent evaporation; give the cells a short interval of rest, and they will then be ready for service.

DIRECT transmission of power from the motor shaft to the wheels without intermediate gears is accomplished for the first time in the history of the automobile industry." The foregoing statement precedes the announcement of the Holsman Automobile Company, of Chicago, in placing upon the market its new model, Holsman "Gentleman's Automobile." As a pioneer in the construction of what is known as the auto-buggy type, the Holsman Company is well qualified to speak, and the special and distinctive feature that characterize the company's products, and which are set forth in a neatly printed and illustrated booklet, make interesting reading for the thoughtful buyer.

One of the most noticeable features of the new model is the motor, which is an air-cooled, four-cylinder, four-cycle type, rated at 26 horsepower. In the illustration below, the motor, complete, with carbureter, twin mufflers, oiling device, ignition

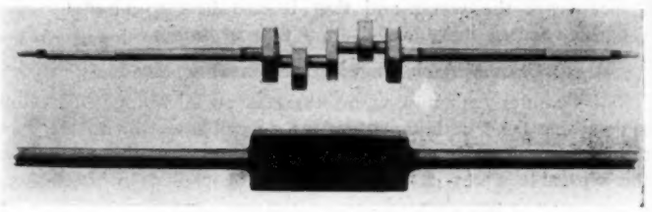


Unit Power Plant and Drive of the 1909 Holsman.

apparatus and transmission for both low and high gear is shown, giving an idea of the compactness of the power plant. In the suspension of this unit power plant great care has been used that no vibration of the motor is communicated to the body of the vehicle, and is so attached that the whole machinery may be quickly removed from the frame for repairs or even for transfer to another Holsman. Throughout the whole machine, either Hyatt flexible roller bearings or radial ball bearings are used, and in the illustration at the bottom of the second column is shown the rigid connection between two pistons with the roller bearings in place, and two of the three 5-inch radial ball bearings used.

There are no gears in the motor, the inlet valves being automatic and the exhaust valves are operated from the shaft without any intermediate appliances, such as gears, push-rods, etc. The lubrication has been accomplished in a very novel way without the use of an oil pump or similar attachment, by dissolving the requisite amount of oil in the gasoline, whence it is carried in the form of a vapor directly to the parts where it is most needed. No oil adjustment is considered necessary, as the proper quantity of oil is always in proportion to the work required of the motor, for as the work increases the amount of the charge has a corresponding increase with its quota of oil.

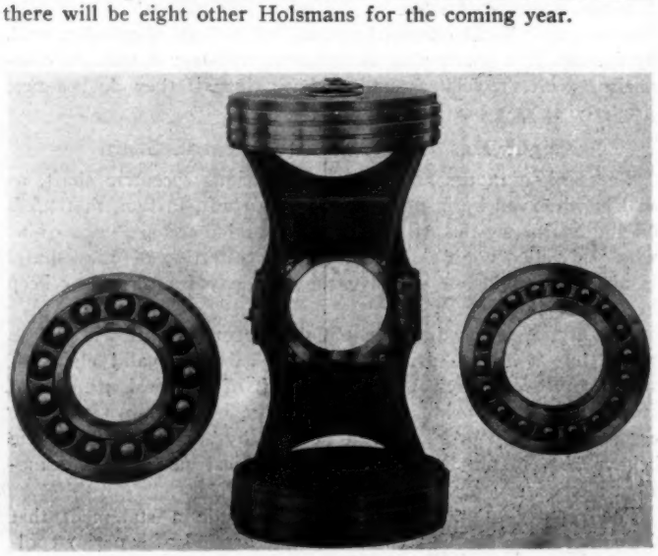
In the design of the transmission the Holsman Company has followed out its desire to make the whole machine as simple as possible, both the low and high speeds being direct from the motor shaft to the wheels, through the newly patented steel friction chain. One control lever of the rack and pinion type easily operates both forward speeds and reverse. There are no other change-gear parts or levers except the foot brake, and the vehicle starts and runs from zero to 25 or 30 miles an hour by friction of the steel chains operating on grooved sheaves on the ends of the motor shaft to the sheaves on both the rear wheels. In case of hills or mud, etc., sufficient to stall the motor on high speed, the low comes into action by engagement of sprockets on the motor shaft with the chain, and when the necessity for greater power has passed, the high gear automatically returns into operation by simply relieving the tension on the chains by the control lever. The reverse is accomplished by pushing the grooved pulleys on the ends of the shaft back into engagement with the channels or rims of the wheels, by the same control lever. The driving chains are wholly and automatically raised from engagement whenever the tension on them is relieved or the brake is set, or reverse is in action. Thus all operations of driving are accomplished with the power direct from the motor shaft to the wheels through the friction chain drive without the intervention



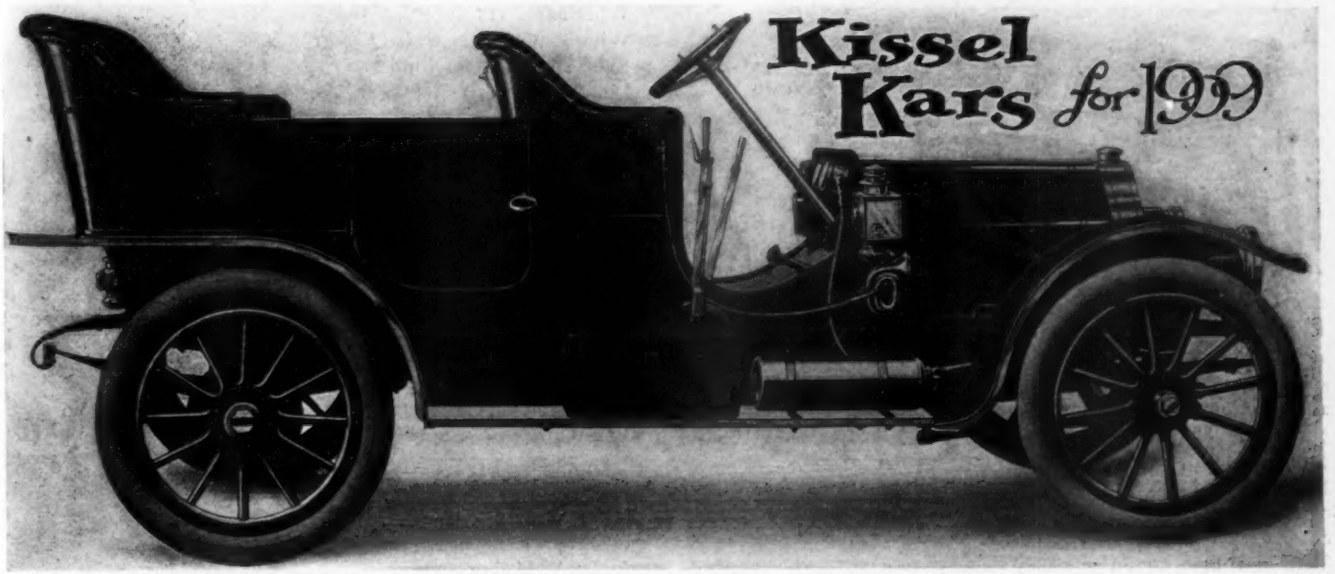
Crankshaft Blank and the Finished Piece.

of any countershaft or jackshaft, and the power is so sufficient that the company guarantees the motor to turn the wheels on any road surface whether the vehicle moves or not.

In the matter of conveniences, which go to make up a complete automobile, the manufacturers have provided some handy methods of operation. The motor shaft being across the car arrangement is made that the engine may be started from either side, and hand-in-hand with it goes the provision for steering from either seat, the steering lever being so designed that it can be turned either way, and operation is equally convenient from the right or left hand seat. The switch, ignition and carbureter adjustments are brought to the middle of the front seat so that the carbureter can be adjusted without stopping the vehicle. A weather-tight box is supplied in front and in the rear another compartment for carrying luggage, etc. Both the front fenders and the lamps turn with the wheels. In addition to this model there will be eight other Holsmans for the coming year.



A Pair of the Twin Pistons and the Shaft Bearings.



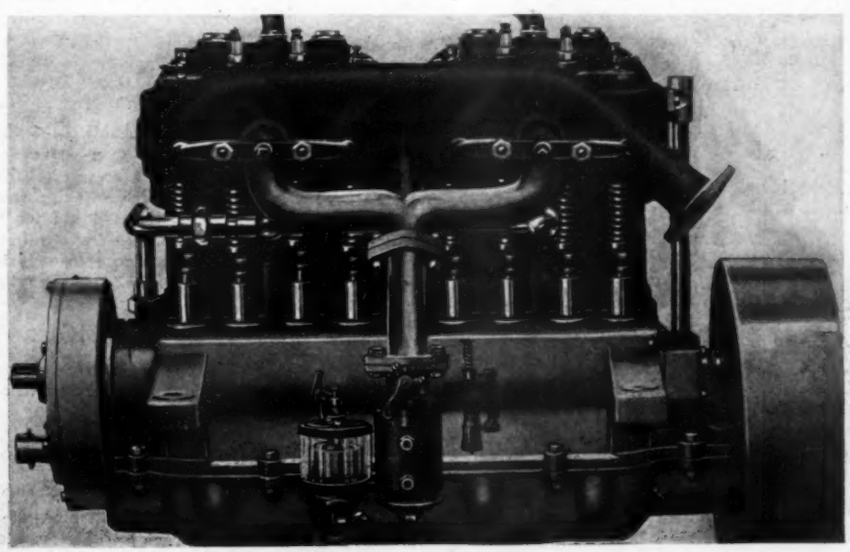
Forty Horsepower KisselKar Continued for 1909 in an Improved Form.

THREE chassis types of KisselKars are listed for 1909, one a carried-over type with improvements, the others new creations. The carried-over style is a 36.1-horsepower, four-cylinder car, regularly rated at 40 horsepower. The new models are a 28.9-horsepower, five-passenger car, also built in roadster and tourabout lines, and a six-cylinder 60-horsepower machine which, according to A.L.A.M., has a 54-horsepower rating. In all three types the Kissel Motor Car Company, with its factory at Hartford, Wis., follows the same design which can be summarized as such cardinal constructions as cylinders in pairs with valves on the left side, cone clutch, selective gearset, shaftdrive, a general use of Timken bearings, and double ignition.

The cars show many improvements over the constructions of the present year, many of which can be gleaned from the 36.1-horsepower model, which is a continuation of this year's car. The road wheels have been increased from 34 to 36 inches in diameter; the wheelbase lengthened from 108 to 115; the I-beam axle dropped so that it affords a carriage 2 inches lower than this year's; in the rear axle Timken roller bearings are used in front and rear on the driving pinion; brakes have been increased from 11 to 14 inches in diameter with 3-inch width; the emergency lever is pulled instead of pushed in applying the brakes; instead of the four-unit coil employed in the ignition system, use is made of an Atwater-Kent generator, or Remy magneto, and when the latter is employed, a single unit non-vibrating coil is used with it; steering spindles are heavier; all operating levers are made from drop forgings; Spicer universal joints have been introduced intc the propeller-shaft; the body is made of metal and in straight line design; three-quarter elliptics support the rear, where semi-elliptics have previously been employed; and, making the tonneau 6 inches longer, gives room for additional seats. To these changes could be added a list of minor ones, all of which show the care with which the next year models have been worked out during the past year.

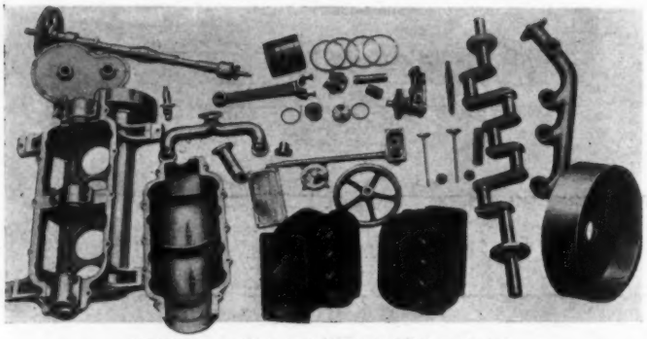
Of the two new models, the 28.9-horsepower one will doubtless be the popular branch of next year's output. It is made with a 4 1-4-inch square cylinder, conventionally designed with a two-part crankcase, three-bearing crankshaft, enclosed engine gears, and valves opened by direct lift from the camshaft, through lifter-rods with rollers on their lower ends; the crankshaft goes through the usual machining and grinding process and is carried on hand-scraped Babbitt bearings; the other motor parts, such as valves, camshaft, pistons and connecting rods are carefully manufactured. Lubrication is by mechanical force feed oiler, carried on the right rear motor arm; the Stromberg carbureter is fitted, and ignition is of the jump-spark type. In the ignition outfit is used an Atwater-Kent combination with dry cells, and Remy magneto with single unit non-vibrating coil, each operating with an independent set of spark plugs.

In the 40-horsepower four-cylinder, and the 60-horsepower six-cylinder, use is made of a 4 3-4-inch square cylinder, made in twin castings along the design identical with that of the little motor. In these the ignition is similar, except that in the six, when built for seven-passenger use, a Bosch high-tension magneto is fitted.



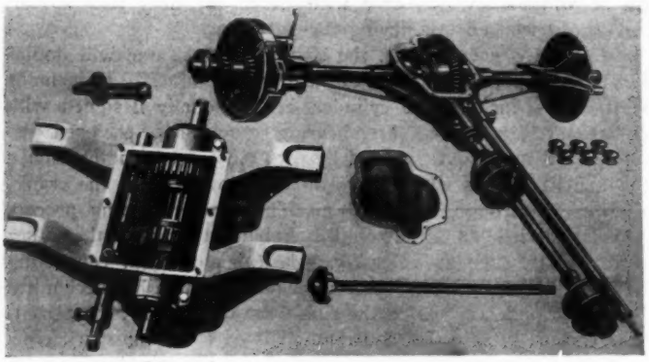
Motor of the KisselKar as Seen from Intake Side.

Conspicuous in the KisselKar transmission is the use of an inside change speed lever, which operates through a slot in the floor of the footboard, which location has been used to obviate the boring of the side member of the frame to accommodate the shifter sleeve attached to the bottom of the change speed lever. The transmission box finds support on the same



Chief Essentials of the KisselKar Motor.

subframe members which carry the motor, both of these important functionaries having a pair of integral side arms for support purposes. The Spicer universals, two of which are used in the propeller-shaft, are fitted with hardened and ground pins and bushings, and have metal covers for adjustment, giving proof against dust and the leakage of grease. The floating rear axle construction used in all models has the driveshafts supported on Timken rollers, and the greatest improvement is the increased size of the internal and external brakes. In connection with the adoption of 3-4 elliptic springs in the rear, which is a change in harmony with several of the leading American makers this year, and which has been taken up by foreign makers during the last

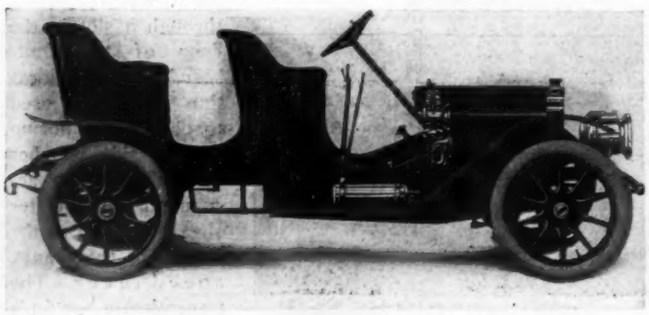


Sliding Gearset and Rear Axle Driving Unit.

couple of seasons, is the use of a conventional torsion bar between the differential housing and the frame cross piece for absorbing the driving strain. Springs of this nature give a particularly low body carriage at the rear, and afford good spring action. The specifications of the different models are as follows:

40-HORSEPOWER TYPE.

Motor, four cylinder, twin castings.
Bore, 4 3-4 inches.
Stroke, 4 3-4 inches.
A. L. A. M. horsepower rating, 36.1 horsepower.
Transmission, selective three speeds.
Rear axle, floating Timken bearings.
Front axle, dropped I-beam.



KisselKar Model LD 9, the New Car at $1,500.

Brakes, internal and external rear hubs 14 by 3-inch drums.
Wheelbase, 115 inches.
Wheels, 36 inches with Q. D. rim.
Rear springs, 3-4 elliptic.
Ignition, Atwater-Kent, or Remy magneto.

30-HORSEPOWER TYPE.

Motor, four cylinder, twin castings.
Bore 4 1-4 inches.
Stroke, 4 1-4 inches.
A. L. A. M. horsepower rating, 28.9 horsepower.
Transmission, selective three speeds.
Rear axle, floating, Timken bearings.
Front axle, dropped I-beam.
Brakes, internal and external rear hubs 14 by 3 inch drums.
Wheelbase, 107 inches.
Wheels, 32 inches with Q. D. rim.
Rear springs, 3-4 elliptic.
Ignition, Remy magneto with coil and dry cells.

60-HORSEPOWER TYPE.

Motor, four cylinder, twin castings.
Bore, 4 3-4 inches.
Stroke, 4 3-4 inches.
A. L. A. M. horsepower rating, 54.1 horsepower.
Transmission, selective.
Rear axle, floating, Timken bearings, re-enforced.
Front axle, dropped I-beam.
Brakes, internal and external rear hubs 14 by 3-inch drums.
Wheelbase, 130 inches.
Wheels, 36 inches.
Rear springs, 3-4 elliptic.
Ignition, Atwater-Kent system and Bosch magneto.

THE AUTOMOBILE CALENDAR

AMERICAN.

Shows and Meetings.

Dec. 31-Jan. 7..—New York City, Grand Central Palace, Ninth Annual Automobile Show, conducted by the American Motor Car Manufacturers' Association, with Exhibits by the Importers' Automobile Salon, Inc., Alfred Reeves, General Manager, 29 West 42d St.

Jan. 16-23.....—New York City, Madison Square Garden, Ninth Annual National Show of the Association of Licensed Automobile Manufacturers. M. L. Downs, Secretary, 7 West 42d St., New York City.

Jan.....—Fourth Annual Meeting, Society of Automobile Engineers. Dates to be announced definitely later. Charles B. Hayward, Secretary, 231 West 39th St., New York.

Feb. 6-13.....—Chicago Coliseum and First Regiment Armory, Eighth Annual National Exhibition, National Association of Automobile Manufacturers. S. A. Miles, Manager, 7 East 42d St., New York.

Mar. 7-13.....—Buffalo, Second Annual Power Boat and Sportsman's Show, Convention Hall, Dal H. Lewis, manager, 760 Main Street, Buffalo, N. Y.

Races, Hill-Climbs, Etc.

Oct. 24.....—Vanderbilt Cup Race, Long Island Course, auspices of Vanderbilt Cup Commission.

Oct. 31.....—Philadelphia, Sixth Annual Run of Automobile Club of Philadelphia for the Brazier Cup.

Nov. 5-7.....—Detroit, Three-Day Endurance Run, Detroit Automobile Dealers' Association.

Nov. 26.....—Savannah, Ga., Grand Prize Race, Savannah Automobile Club.

FOREIGN.

Shows.

Nov. 13-21.....—London, Olympia, Seventh International Motor Exhibition.

Nov. 28-Dec. 13.—Paris, Eleventh Annual Salon de l'Automobile, Grand Palais, Automobile Club of France (Pleasure Vehicles, etc.)

Dec. 20-28.....—London, Stanley Show, Agricultural Hall.

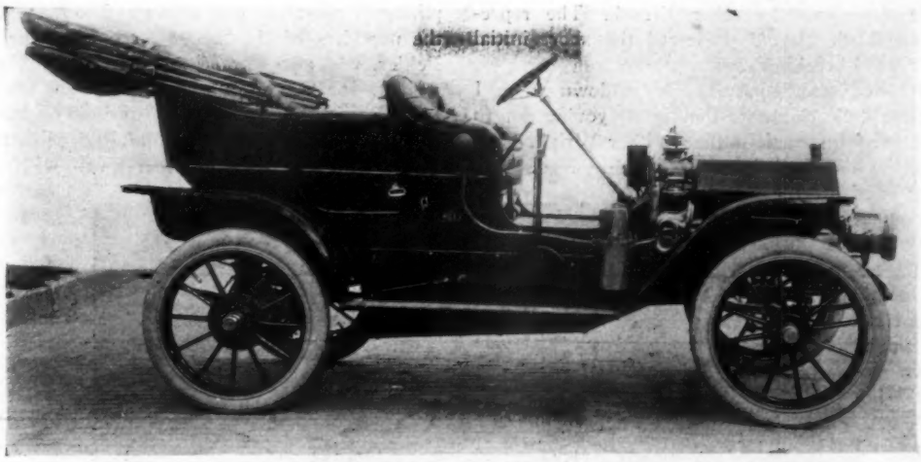
Dec. 22-29.....—Paris, Eleventh Annual Salon de l'Automobile. (Commercial Vehicles, etc.)

Jan. 16-25.....—Brussels, Show Organized by Belgian Chamber Syndicate, Palais du Cinquantenaire.

TWO NEW MODELS OF THE REO FOR 1909

MANY American automobile manufacturers have been striving for some time to produce a machine at a price which would be within the reach of the largest number, but were unable to do this for some years, largely because of the expense of production due to the newness of the industry. For 1909 the Reo Motor Car Company, of Lansing, Mich., is producing two new models similar to the 1908 design but at a lower cost, which it thinks will meet the requirements for this class of car.

Although the specifications for the 1909 models are the same as the 1908 cars with the exception that the wheelbase of the two-cylinder touring car and roadster is increased from 94 inches to 96 inches for the purpose of providing more leg room, some few changes have been made, all tending to add to the general improvement of the Reo product. The hood, which is similar to the 1908 type, has been reinforced at the corners with filler tubes extending through the top in place of the old style loose cover. The body is of aluminum coated metal with detachable rear seat. To insure proper lubrication grease cups are provided on all outside oil holes, spring shackles, steering spindles, and reach rods. The brake lever has been lengthened, giving a greater leverage and insuring better and easier control of the car. The front axle has been changed to the I-beam drop-forged type, with ball-bearing front spindles and 5/8-inch balls. The steering post has been given more rake to facilitate handling the car, and the steering gear has also been materially strengthened. The transmission brake drum is of a new design, in order that improvements tending to make the chain noiseless could be incorporated in the new models.



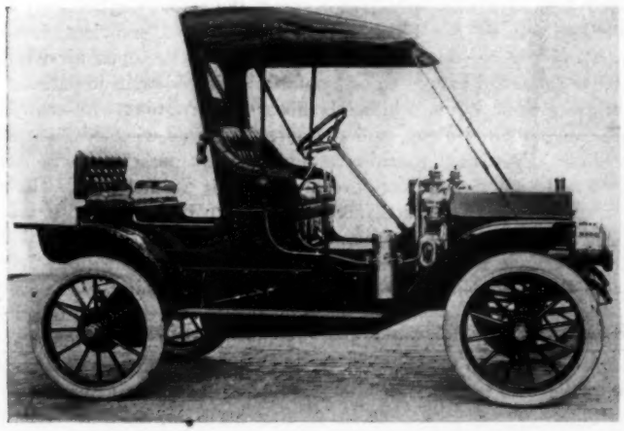
Five-passenger, 20-Horsepower Reo Touring Car for the Coming Season.

Model H 20 horsepower roadster, listing at $1,000, is built on the same chassis as the touring model except that in place of the tonneau a trunk box is fitted to the back and an extra seat, with a rail around the floor boards; in addition this model is furnished with a top as the regular equipment. Should the owner ever desire to convert this model into a touring car he can readily do so as the design is so arranged as to provide for this.

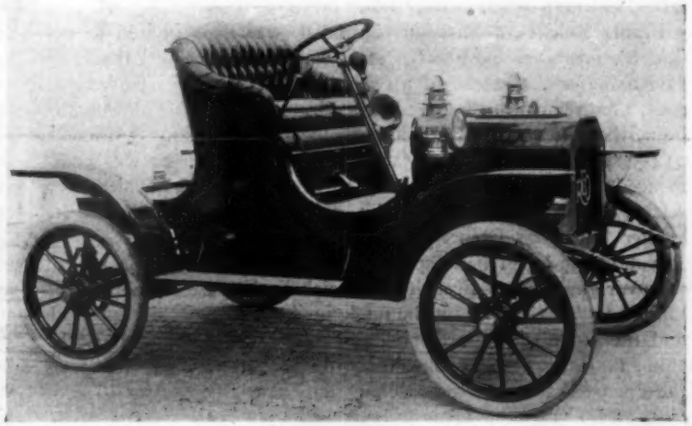
In the two passenger 10-horsepower runabout the Reo people are furnishing the same car for 1909 as the 1908 model for $500, with some changes for the better. The chassis is the same except that now they have made use of similar cam-shaft bearings and valve mechanism as is employed in the two cylinder machines. The front axles are also of the same type as the larger car, being I-beam sections from drop forgings; 5/8 inch ball bearings are provided on the front spindles the same as for the larger model and grease cups on all outside bearings. In general design the body has not been changed although the seat is similar to the one on the two-cylinder car, undivided, straight back, of aluminum metal material. The fenders on this model are all skirted the same as on the higher priced machine, which protects the body and lessens vibration.

In the matter of finish and general workmanship the Reo Motor Car Company has seen to it that when these new models are sent out from the factory they will make a showing both in appearance and performance on the road that will be in itself a tribute to the moderate and low-priced cars. The power plants of the Reo cars are so well known that comment seems rather unnecessary here; the same two and single cylinder engines with 4 3-4 inches bore and 6 inches stroke being used for 1909. The spring equipment—another vital part of a machine—has also proven itself efficient for the service required and no change has been deemed advisable.

The manufacturing of these two models realizes an old ambition of R. E. Olds and R. M. Owen, that is, to put on the market a touring car and a runabout at a popular price and of material which they felt would bring credit to the makers.



20-Horsepower Reo Roadster with Extra Seat.



Reo 10-Horsepower Runabout Listing at $500.

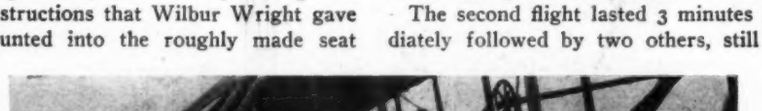
WILBUR WRIGHT TAKES PASSENGERS ALOFT

By W. F. BRADLEY.

LE MANS, Oct. 10.—Any man, even in France, who would maintain that Wilbur Wright is not at the head of all aeronautical experts would now be looked upon as a fool. Even the weak criticisms against the starting rail and the home-made motor are becoming less and less, experts and the public recognizing that if the workmanship is rough the machine is none the less the only one that can fly whenever its owner wishes to go aloft.

After showing that he could make time and distance records to order, Wilbur Wright began a series of demonstrations with two persons on board. First place was offered to a couple of journalists, the one American the other French. The representative of the New York *Herald* preferred the short initial flight to the second record-breaking soar.

"Sit well back in your seat, push that lever down when I nudge you elbow, then look pleasant; that is all you've got to do." Such were the brief instructions that Wilbur Wright gave to his passenger as he mounted into the roughly made seat stuffed with straw and covered with sacking. A minute later the two mechanics had started the engine by swinging round the propellers, Wright had buttoned his coat, pulled down his cap, then released the pin and shot off into the air.



Wilbur Wright Regulating Aeroplane; Henry Farman Thinking Hard.

Immediately it was evident that with two persons the aeroplane acted better than with only one. During the morning, when flying alone, the aeroplane had advanced with a gentle wave-like motion. With a passenger on board the line of march was so straight, the machine remained so accurately at the same elevation that it appeared to be guided through the atmosphere by invisible cords. As it neared the end of the field it descended a little, for all curves are taken with a considerable inclination, much in the same way as a cyclist would take a banked curve, but immediately after the original height was again attained and maintained. The curves are necessarily sharp, for the field, though about three miles in length, is not more than 400 yards in width, and Wright never uses more than 300 yards. Two complete rounds were made, lasting a fraction over three minutes.

Frantz Reichel, a Parisian journalist, was next invited to get into the machine, and another start was made with just the same ease as before. Instead of a couple of rounds of the field, however, the artificial bird soared around and around for almost one hour, the time, according to the official figures, being 55 minutes 23 4-5 seconds. As it was 5.20 P. M. when the flight was commenced, daylight had given way to dusk before the white flyer settled down again with its calm, collected Yankee pilot and its excited, vivacious French passenger.

Not a word had been spoken up aloft, for the simple reason that Wright ignores French and Reichel's English vocabulary is limited to "all right." But he made up for it on reaching ground, and the story of the tremendous rush at the starting line, the calm, majestic flight, broken only by the monotonous rattle of the open exhaust, the approaching darkness, the wonderful control, and finally the apparently tremendous rush toward earth, followed by a stoppage so gentle that not a tremor was felt—all this was told a score of times in that picturesque manner that only French can command, repeated to all on the journey to Paris and again related on the following day.

After a Sunday spent behind closed doors, the aeroplane was brought out early on Monday morning and an invitation sent to Léon Bollée to come for a flight. Though he needed no pressing, the pioneer automobile constructor was certainly surprised, for he scales 238 pounds, and such weights have not generally been associated with aeroplanes. But the "cent kilos" of the motor manufacturer were taken aloft as easily as the featherweight journalists, and when Léon Bollée came to earth after 4 minutes 9 seconds in the air he was so delighted with the simplicity of operation that he wanted to make a flight alone. After the president of the Sarthe Aero Club, the vice-president, René Pellier, was also invited to take a ride. Again it was a heavy weight, for though M. Pellier has not the same corpulence as Léon Bollée, he can lay claim to close on 200 pounds weight.

The second flight lasted 3 minutes 54 seconds, but was immediately followed by two others, still with the same passenger, one being for 7 minutes 30 seconds and the other of 30 seconds only. A slight incident marked the last flight which, though not of great importance in itself, was sufficient to show the wonderful control that Wright has over his apparatus. His cloth cap being in danger of being carried away by the wind, Wilbur Wright put up his hand to save it, at the same time releasing his hold of the elevation rudder. The action caused him to touch the string by which the ignition cut-out is operated, and immediately the motor stopped. Seizing the lever again, Wright brought his machine back to earth a little more brusquely than usual, but without any serious shock.

Long and careful preparations were made before any of the two-men flights were attempted. The engine was dismounted, carried to the Léon Bollée factory at Le Mans, and thoroughly overhauled, the lubrication especially needing attention. While it was under repair the two propellers were changed for a pair of larger diameter and much broader face, the pinions also being changed to give a slightly higher speed, the ratio now being 33 to 10. The test on the block was not considered sufficient, however, and for one hour the motor was run in the open air while several thousand people stood round and fumed with impatience. Darkness came down while the motor was running, the crowds reluctantly melted away, and the aeroplane was wheeled back to its shed. Even next morning a flight with a passenger was not attempted immediately, but several rounds of the field made alone at a height of not more than one foot from the ground. It was doubtless done as a precaution after the accident in America, but was nevertheless one of the most remarkable demonstrations ever made, the areoplane just skimming over the ground, yet never striking any of the obstacles. Wright laughingly declared that he was practicing for an automatic shaving apparatus; he would attach the razor to the bottom of his machine and the customer would lie face upwards on the ground. It was only after five or six flights alone, each time at an increased height, that Wilbur Wright appeared to be satisfied and offered to take the first passenger with him.

One of the reasons for the special precautions is that the larger propellers come very close to the wire cables operating the rear propeller, and it was owing to this cable being struck by one of the propellers that Orville Wright's accident occurred. This, at any rate, is the explanation given by the brother in France, and in confirmation of the theory it was noticed that a special stay had been fitted to prevent any of the cables fouling the propeller, even, if for any reason or other, they were slackened off during a flight.

Wilbur Wright's method of control is simplicity itself. On the machine being placed on the starting rail and the 1,700-pound weights being drawn to the top of the pylone, the end of the rope is attached to the wooden carriage on which the aeroplane rests. This task is invariably attended to by Wright himself. Standing in front of his machine, Wilbur Wright relieves the compression, orders his mechanics to give two or three turns of the propellers, injects a little gasoline through the two air inlets, then gives the order for a sharp pull on each of the propellers. Generally the motor goes off at the first pull, and immediately runs at its maximum, for there is neither spark lever nor throttle control, the pilot thus being under no necessity to occupy himself with the engine while in the air. If it is desired to stop, the pilot puts up his hand and strikes a piece of string attached to one of the wire stays. This short circuits the electric current, and, of course, causes an instant stoppage of the motor. The engine, which has four separate water-cooled cylinders of 4 by 4 3-4 inches bore and stroke runs normally at 1,100 revolutions a minute. The gasoline supply is carried in a cylindrical tank suspended to the uprights, and sufficiently high to assure a flow by gravity. There is no carbureter, the engine being fed by direct injection, the pump being within the crankchamber and worked by worm gear off the camshaft. Inlet valves are automatic and exhaust valves mechanically operated, but sets in the cylinder head. Ignition is by Eisemann high-tension magneto, bolted to the engine base, and having separate coil immediately under the wooden frame on which the motor rests.

Wright and Zens Ready for Flight.

When flying, the pilot has to operate two levers only, the one in his left hand having a fore and aft movement only, and controlling the front elevation plains, and the one in his right hand having a combined fore and aft and left and right movement. If pushed to right or left, it operates the rear rudder in just the same way as the tiller of a boat, and gives a right or left turning movement to the aeroplane. If pushed forward at the same time, it elevates one wing tip and lowers the other; if pulled rearward, the wing tips are pulled in the opposite direction.

Léon Bollés, who during his flight closely watched the operations of Wright, declares that the apparatus is heeled over, by means of the curving of the wings immediately before the turn is taken and brought back to a horizontal position a few seconds before the turning movement is completed. As soon as the aeroplane is brought back to a horizontal position, the wing, which was describing the shorter curve, regains its speed until it is traveling as fast as the other, and there is a very energetic leveling movement for a slight bending of the wings.

To the spectators, the turn takes place much earlier than is really the case. Wright first inclines his apparatus to a sufficient degree, and it is only when it is sufficiently inclined that he operates his rear vertical rudder and makes the actual turn. This phase of the operation of an aeroplane presents a very interesting study, and its scientific side has phases that never fail to interest.

Wright Captures Official Two-Passenger Record.

LE MANS, Oct. 12.—Still another record for Wilbur Wright. With Arnold Fordyce, a French journalist, on board, the white bird from Dayton has remained above the heather-covered military ground in the neighborhood of Le Mans for 1 hour 4 minutes 26 1-5 seconds, beating all two-man aeroplane records and fulfilling the conditions imposed by the Lazare Weiller committee.

It was not intended to make a flight on Tuesday, October 6, for the magneto had gone out of business and Wright had no desire to venture aloft until the motor was in perfect condition. Contrary to his usual custom, Wilbur Wright allowed an outsider to examine his carefully guarded machine, with the result that M. Girardot and Hart O. Berg's mechanic quickly diagnosed and remedied the defect of the magneto.

A little before six a start was made, the machine at once rising to a height of about 75 feet and remaining there despite the gusty weather for half an hour. At times a guest of wind would catch the aeroplane, causing it to make a dive that looked dangerous to the public. But Wilbur Wright was never caught napping. To each sudden change of the wind he replied by a manipulation of the rudder and a working of the wings that brought the artificial bird to an even keel and kept it on its right course to the finish. Later, in view of the approaching darkness, a descent was made to about 30 feet from the ground, and it was while at this height that the signal was given, by means of two white lights from the observation tower, that the previous record had been broken. When it was certain that he had been aloft more than an hour Wilbur Wright descended between the starting rail and the wooden shed which serves as home for himself and his artificial bird, when both machine and operator are at rest and hidden from the world at large.

Since making his record flight Wilbur Wright has been allowing aeronauts, journalists and others to taste the joys of mechanical flight. Hart O. Berg, as a reward for his active organization of the Wright demonstrations in France, was given a sail in the air for 3 minutes 24 seconds. Mrs. Berg then took her husband's place, and for 2 minutes 3 seconds evolved over the heads of the spectators. Later in the day four other privileged individuals were taken aloft with the American aeronaut for flights that lasted on an average 4 1-2 minutes.

The following day a group of Englishmen were initiated into the mysteries of aerial flight, Griffith Brewer, Hon. C. S. Rolls, Frank Butler, and Major Baden Powell being successively flown twice around the field. Madame Léon Bolée, following the example of her husband, asked for a ride and was rewarded by a flight of three minutes. Finally Commandant Bottiaux, chief of the Chalais army balloon station, was given a special demonstration, Wright starting low, then rising suddenly to a height of 80 feet, then again descending until he was so low that his skates almost touched the top of the heather, and his propellers disturbed the loose sand on the open spots.

THE AUTOMOBILE

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FOUR-CYCLE FINALITY OF DESIGN.

It is with considerable reason that the present day four-cycle motor has been regarded as a close approach to finality of design where its type is concerned, and that a total departure rather than a modification of existing methods has been looked forward to as the trend of the future. In other words, the development of the two-cycle motor to a point where it was considerably the superior of the present four-cycle type has been considered as the logical outcome of the persistent efforts of inventors to improve the internal combustion motor. Hence, the report that one of the foremost Continental motor builders has definitely decided to adopt a sliding valve type of four-cycle motor of American origin from now on, comes as no little surprise.

The poppet valve has its drawbacks, but its advantages over any other method of admitting and exhausting the charge hitherto developed have been so numerous and practical that its abandonment has not been considered probable without a change of cycle. The handling of the fuel through ports of large area, opened and closed by the piston itself has always appealed to the designer of internal combustion motors as one of the chief promises of the two-cycle type, in that it makes for a degree of simplicity to which the four-cycle motor, with its multiplicity of small parts, does not lend itself. But if this end can only be achieved by the employment of an equivalent amount of gearing to open and close the ports, wherein lies the advantage?

Simplicity, coupled with a high degree of efficiency, must ever be the chief aim of the inventor whose object is the advancement of the present day motor, and this is not to be attained by the abandonment of a form of mechanism that years of practice on a great number of motors has shown to be practical, in favor of a device, the chief merit of which is that it accomplishes the object in a different manner, but with no reduction in complication, relatively speaking. The mere fact that the result in view may be brought about by the new method is not sufficient to recommend it as being superior to the device it is intended to supplant, which appears to have been the basis upon which many so-called improvements in automobile construction that have since been relegated to the limbo of oblivion, were accepted. But in the present instance the reputation for conservative and consistent adherence to sound and well-tried principles of design on the part of the European house lends added weight to the report of the adoption of this new type, though further developments in this direction will be looked forward to with a great deal of interest.

* * *

A DEPARTURE IN BRAKE PRACTICE.

One of the last things that the average driver is anxious to have come in contact with the brakes of his car is oil, so that at first sight the proposal to employ brakes running in oil appears somewhat far-fetched, in view of the fact that even a small amount of lubricant is destructive of the frictional properties of two rubbing surfaces. This is true of metal, wood, or fiber surfaces, regardless of their character, but it is one of the peculiar properties of cork that its coefficient of friction with a metal surface is but very slightly influenced by the presence of oil in any quantity, and it is this that has made possible what may best be termed an oil-cooled brake.

The metals employed are bronze against steel, the former constituting the shoe or moving member, being shod with corks embedded in its face. This member is immersed in a bath of lubricating oil and is constricted against a steel drum, or expanded to contact with it, according to the requirements of the design. In one instance, a brake of this type has been employed on a car that saw 12,000 miles continued service of the most strenuous kind, but an examination revealed no perceptible wear in the braking surfaces.

This was naturally to be anticipated in view of the protecting influence of the oil, and the possibilities that it throws open in the way of improved brake service, as compared with the present day practice of employing frictional materials that must, of necessity, be renewed periodically, are limitless. It would be futile to attempt to pit either the water or the air-cooled brake against one constantly immersed in oil, as in view of the peculiar property of cork in not losing its frictional properties under the influence of a lubricant, the advantages of a generous supply of oil for cooling are obtained, without the attendant disadvantages of lubrication, which are naturally not to be desired where the object in view is the maximum friction.

FROM BOSTON TO NEW YORK BY MOTOR AIR LINE

BOSTON, Oct. 20.—When the Glidden tour paused in Boston, last July, Charles J. Glidden, the donor of the trophy, caused a brief commotion by letting out the fact that he was organizing a company with the object of establishing a passenger and freight service by balloons or other means of aerial transportation between this city and New York. The scheme was looked upon with considerable scepticism by the general public, but those whose memory carried them back a few years to Mr. Glidden's prophesies of the development of the motor vehicle, did not scoff. To-day it looks as if commercial aerial navigation may not be so very far distant.

Captain Thomas S. Baldwin, the aviator, who recently sold an air-ship to the United States government, was in this city yesterday and to-day and held a conference with Mr. Glidden concerning a contract for a dirigible balloon to be used by the Aerial Navigation Company in establishing the beginning of its New York service. The air-ship will be of large proportions, capable of carrying two passengers in addition to the operator, and it will cost about $25,000 to start the service. The money is available, so that there will be no bonds or stock to be floated as an additional burden on the air line. It is not proposed at once to undertake a direct New York service. In fact, the plans so far arranged are very conservative. They contemplate an air-ship service two or three times a week between a station to be established on the outskirts of this city and South Framingham, about twenty-five miles away.

The Boston station will be established at a point easily accessible for some of the lines of older transportation companies and the hydrogen gas for the air-ship will be manufactured at this station. Captain Baldwin has discovered a fabric for air-ship or balloon envelopes which he believes will help materially in solving the problem of preventing the waste of gas and he will use this material if he is given the contract for the balloon. If the Boston-South Framingham service develops as well as is expected other stations will be added and eventually there will be a through line to New York. The company has not yet progressed far enough to establish a freight and passenger tariff and is more interested in starting the line than in the profits.

AN INTERNATIONAL SPORTING TRUST?

The International Association of Recognized Automobile Clubs of the World has some grand plans in view for the future, and the story heard at Dieppe, to the effect that the scope of its operations would be extended to include motor boating and aeronautics, is now verified by an announcement from Secretary S. M. Butler, of the Automobile Club of America. This is to the effect that this club has been selected as "sole representative in America, which selection carries with it the sole governing authority in all international motor boat races or competitions held in the United States." The exact name of this new motor boating body is "The International Association of Yachting-Automobile." It is known that recently, under the direction of Dave Hennen Morris, the A. C. A. has been organizing a motor boat section, "and this division will be strictly a yachting adjunct to the club."

The principal objection of American automobile clubs against the present international organization is that it permits only one club to represent a country, and compels all other clubs to deal through the club possessing membership, even if that club is not selected by the entire association of clubs. A similar objection will undoubtedly be encountered in motor boating and also in aeronautics.

It is now generally known that an unusual combination of circumstances brought about the continuance of the A. C. A. as the international automobile voice from this country, and there are American clubs which are finding considerable fault with the arrangement consummated. What the future may develop seems to be a matter of varied opinion.

QUAYLE VICTOR IN SPEED TRAP FIGHT.

ALBANY, N Y. Oct. 20.—Oliver A. Quayle, a victim of the notorious Glens Falls speed trap, has won out in his stubborn legal fight to have his conviction set aside. Quite a howdydo followed Mr. Quayle's conviction, for the reason that he is president of the New York State Automobile Association, whose policy is to uphold the speed laws of the State. Mr. Quayle appealed his case, and the county judge of Warren County has just reversed the judgment of conviction.

This Glens Falls speed trap has been operated for the past two years and many a tourist has fallen into its clutches.

Mr. Quayle was arrested last June while touring with his wife. His contention was that the trap was improperly operated, to the end that injustice was done, not only in his case, but in that of many others. The result of his appeal confirmed his contention. It will probably encourage other automobilists to take appeals in cases of flagrant injustice and may possibly enlist the more active and general co-operation of local clubs in their efforts to have the evidences of speed law violations collected in a way that gives no opportunity for injustice.

A Y. M. C. A. SCHOOL FOR PHILADELPHIA.

PHILADELPHIA, Oct. 19.—Following the example of New York, Chicago, and other large cities, Philadelphia will have a Y. M. C. A. automobile school. On the 21st of this month the scheme will be inaugurated at the Kensington Y. M. C. A., at 1854 Frankford avenue, under the chief instructorship of William Vees, a well-known owner and operator of automobiles.

MASSACHUSETTS COURT RULES FOR LOCAL REGULATIONS

BOSTON, Oct. 20.—The full bench of the Massachusetts Supreme Court to-day handed down a decision in the case of the Commonwealth against Arthur Kingsbury, for which automobilists have been looking forward for several weeks, or since the case was heard at the Franklin county session. The court decides adversely upon Mr. Kingsbury's contention that the law permitting local boards of aldermen and selectmen to exclude automobiles from certain highways, is unconstitutional.

Mr. Kingsbury was arrested for driving his automobile on a highway in the town of Ashfield, from which the selectmen had voted to exclude motor vehicles and which was posted to that effect. He was convicted and upon appealing to the superior court lost his case in a jury trial. He then carried it up to the supreme court, which holds that statutory regulations of the speed of automobiles running on highways are reasonable and proper.

The court decides that the right of the Legislature, acting under the police power, to prescribe that automobiles shall not pass over certain streets or public ways in a city or town, seems to be well established upon principle and authority; and that the Legislature has the right to delegate police powers to aldermen of cities and selectmen of towns.

KNOX WINS FREE-FOR-ALL AT LENOX.

LENOX, MASS., Oct. 14.—Under the auspices of the Lenox Automobile Protective Association a hill climb was run here to-day. The course was up Church Hill and Aspinwall Park and finished at the Aspinwall Hotel.

A tangle has arisen over the sanction that has some elements of the humorous to it. It happens that a high priest of a metropolitan club with national aspirations is a patron of the hotel at the finish line and that mine host had much to do with the promotion of the meet. Little wonder was it that the landlord in question knew of no other organization that could possibly rule automobiledom than the club, over which once reigned his distinguished guest, and so wrote the manager of its touring bureau for information as regards a sanction. The touring official promptly replied that no sanction was needed, and mine host proceeded with his meet accordingly. M. L. Downs, of the A. L. A. M., a wise and prudent-going man, who went up to Lenox to officiate as judge, bethought himself before the climb had reached a conclusion to ask the promotor for his sanction and received the rather startling information herein above set forth.

The course was nine-tenths of a mile in length, with three sharp turns and grades varying from 9.15 to 12.5 per cent. There were a couple of accidents in the course of the contests. William Bourque, of Springfield, in a Knox collided with an iron post in Aspinwall and was thrown out. Floyd Knight, of Pittsfield, in seeking to avoid a collision with another machine, ran into a tree and put his car out of the climbing for the rest of the day. The Knox and William Bourque, however, were not injured enough to prevent their being gotten into shape for the subsequent climbs, or to prevent them winning the free-for-all and the event for cars from 24 to 40 horsepower as well. The summary follows:

FREE-FOR-ALL.

1.	Knox	38	William Bourque	1:19
2.	Stearns	30-60	William Swan	1:34
3.	Berkshire	30-35	S. H. Clapp	1:43 1-5

FOR CARS FORM 40 TO 60 HORSEPOWER.

1.	Stearns	30-60	William Swan	1:38 1-5
2.	Stilson	55	F. A. Knight	1:47 1-5

FOR CARS FORM 24 TO 40 HORSEPOWER.

1.	Knox	38	William Bourque	1:34
2.	Pope-Hartford	26	O. R. Hutchinson	1:47 1-2
3.	Pope-Hartford	30-35	Lester Phillips	1:57
4.	Buick	35-40	F. A. Knight	1:55 1-2
5.	Berkshire	30-35	J. E. Crabe	2:25 3-4

A HOTEL TRAIN TO SAVANNAH GRAND PRIZE.

That New Yorkers contemplating witnessing the Grand Prize race at Savannah may be assured of all the comforts of a well-appointed hotel and the finest cuisine, W. E. Conklyn, the general eastern passenger agent of the Seaboard Air Line, has arranged for a special train to leave New York at midnight on Monday, November 23. It will be made up of Pullman compartment sleepers, a dining car, and a buffet smoker. It will leave Savannah so as to reach New York at five o'clock in the afternoon on Friday. During the sojourn in Savannah the train will be side tracked and used practically as a hotel. A reasonable rate has been established for the trip.

THESE MUNCIE HOOSIERS ARE HUSTLERS.

MUNCIE, IND., Oct. 19.—The Inter-State Automobile Company of Muncie, Ind., is setting a record pace in progress. It was only a couple of months ago that Thomas Hart, George Ball, William Ball, T. F. Rose, J. M. Waring and other Muncie capitalists formed the company and employed Claude Cox to design a car. On September 14 they got the deeds to some 40 acres of well-located land and by October 14 were putting under roof their first building, a fine structure of brick, steel and glass, 140x440 feet. They expect to begin turning out cars January 1, and have arranged for an output of 1,000 the first year. They will continue the erection of new buildings.

A NIGHT IN TRENTON WITH AUTO PATROL.

TRENTON, N. J., Oct. 12.—"Seems to me I've seen you before," remarked Captain Cleary, as he chewed his mustache reflectively and looked us over, when we arrived at Police Headquarters.

"Oh, yes; now I remember; violating Section 146 of the motor vehicle law, wasn't it?

"You don't care to stay this time, I suppose?" he smiled.

"Well, no; not exactly. You see, we came over to see the new White patrol and ambulance in its natural environment."

"Say, that car's all right. Haven't had time to make its acquaintance personally yet, but do you know, since we retired that old horse ambulance and the 'hurry up wagon,' your car has done the work of the two of them in one-third the time. The only trouble with it is that it's too popular. Guess we'll have to put a row of tacks in the seat. But there goes the bell."

It took us just four minutes to cover the mile and a quarter of busy street, dodging this way and that.

At a glance we realized what had happened. The horizontal ladder had given way at one end and the two painters at work upon it had fallen three stories to the sidewalk. One was unconscious, the other was suffering intensely from a compound fracture of the leg. The stretcher was produced from its compartment beneath the car, and in another minute we had our two patients on board and were off for St. Francis Hospital.

Trenton, N. J., Now Employs a White Steamer as a Patrol.

We were back at "Headquarters" in twenty minutes from the time we left, but were soon off again on another run. The car was wanted at the Court House to transfer a load of prisoners to the County Jail. This trip was a longer one, and by the time we got back there were two calls waiting. There was no time for dinner, for it was Saturday night and people were beginning to get drunk. The one at Box 23 was of the ordinary uninteresting variety; the other was a regular patron, and treated the occurrence with the indifference gained from many similar visits. Another call soon followed, and again we started. There had been a fight, it seemed, which fact we could well believe when we got there—either *that* or an earthquake—for there wasn't a whole window light left in the place. But the participants had fled, nobody knew where. We looked high and low, but evidently they had made good their escape. Returning to the "wagon" we noticed that the driver, who is never permitted to leave his seat, was missing. Fearing that he had met with foul play, we started round the building, prepared for the worst, when we came upon him. He was down on his knees, the tail lamp in one hand and his pliers in the other, pointing them down a cellar-way. At a glance we took in the whole situation. The driver had spotted one of the malefactors and, lacking a better persuasive, was brandishing the shiny tool in the face of the man in the hole, from which came in agonized tones the repeated assurance that he would give up.

"Well, I'll be hanged," said one of the officers, "if that kid driver ain't put it all over

WHAT IS DOING AMONG THE CLUBS

CHICAGO CLUBS HAVE REAL AMATEUR CONTEST.

CHICAGO, Oct. 16.—Chicago's record for originality in the promotion of motoring events was fully sustained yesterday when the Chicago Athletic Association and the Chicago Automobile Club took part in the first amateur inter-club reliability team match ever promoted, it is claimed. True, the present Glidden is somewhat on this order, and while the clubs supposedly battle for the big trophy, yet in reality it is a struggle of tradesmen. Not so was this affair of yesterday, for only owners drove, by which term is meant that no one at all affiliated with the trade was permitted to drive. This brought about a bona fide contest which has done much to make motoring competitions popular among the owners of Chicago.

This inter-club team match stirred the town from the ground up. The leading dealers gladly turned out to act as observers, and the whole affair went off with a snap and bang that aroused general enthusiasm. It had been planned to have ten cars on a team, but this match being a new thing with the Chicago Athletic Association, the cherry circles found it hard to get that many cars. Six only came to the tape, and as the Chicago Automobile Club had ten members eager for the fray, the Glidden rule was adopted and the automobile club penalized six-tenths of a point as against a full point for the C. A. A.

Results gave the victory to the Athletic association, its team of six incurring only 4 points penalization as against 732 for the Automobile club. The latter lost out through accidents early in the fight. The match was over the Elgin-Aurora circuit, but before the two teams got out of town W. A. Egermann in a Rambler was put out by a broken axle, and, a little later, T. P. Henderson in a Studebaker, skidded on Milwaukee avenue and broke a wheel. Egermann telephoned for another car and made the circuit, while Henderson secured a new wheel and also caught up with the procession. The others went along with only minor mishaps, the most serious of which were a vibrator adjustment, taking on water and motor stops. The report of the judges was as follows:

Chicago Athletic Club.

Entrant and Car.	Score.
S. W. Ham, Locomobile	Perfect.
C. T. Knisely, Premier	Perfect.
C. C. Ireland, Stevens-Duryea	Perfect.
W. K. Cochrane, Stoddard-Dayton	Perfect.
F. W. Wentworth, Rambler	1 point.
W. K. Young, Thomas	3 points.
Total	4 points.

Chicago Automobile Club.

Bert E. Nash, White	Perfect.
F. W. Gethre, Stevens-Duryea	Perfect.
R. Tarrant, Jr., Stoddard-Dayton	Perfect
N. H. Van Sicklen, Apperson	Perfect.
Carroll Shaffer, Stevens-Duryea	Perfect.
R. H. Purdy, White	Perfect.
J. H. O'Hare, Thomas	1.8 points.
C. E. Gregory, Thomas Forty	15 points.
T. P. Henderson, Studebaker	115.2 points.
W. A. Egermann, Rambler	600 points.
Total	732 points.

The rules were easy, calling for the contestants to make a non-motor stop run, with penalties for taking on fuel or water and for repairs or adjustments. Owners had to drive themselves. The running time averaged up about 15 miles an hour and no one was late at controls.

NORTH CAROLINANS ORGANIZE CLUB AT RALEIGH.

RALEIGH, N. C., Oct. 19.—The automobile enthusiasts of Raleigh, N. C., have decided that it would be to their benefit as well as the city's if they had some good permanent organization, and at a well attended meeting the Raleigh Automobile Club was formally launched with everything pointing toward success. A full quota of officers were elected and a suitable constitution and by-laws adopted.

MARYLANDERS ELECT DR. ROWE AS PRESIDENT.

BALTIMORE, MD., Oct. 17.—In addition to electing officers for the ensuing year, the Automobile Club of Maryland, at its annual meeting, transacted other important business and determined upon what the members call a rejuvenation with the result that many suggestions for a busy winter were made. The officers elected were as follows:

President, Dr. H. M. Rowe; vice-president, D. C. Walker; treasurer, Ernest J. Knabe, Jr.; secretary, Frank W. Darling.

Board of Governors—James S. Reese, M. S. Hess, C. H. Millikin, A. A. Piper, B. B. Friedenwald, R. M. Norris, Dr. H. M. Rowe, D. C. Walker, Ernest J. Knabe, Jr., and Frank W. Darling. Osbourne I. Yellott was reelected counsel.

An important feature of the meeting was the report of the committee on good roads to the effect that the Baltimore County Commissioners had offered to give the club 800 signboards, 2 feet long by 8 inches wide, and furnish posts for the same, provided the club would paint them and place them in position at points along roads to guide autoists on touring trips. The offer of the commissioners was unanimously accepted. The committee announced that it had already decided upon the locations of 250 of these signs, which will be placed at crossroads and dangerous curves. Later on the club will make efforts to have the commissioners of other counties in the State cooperate with them for the purpose of having similar signs placed in the different counties.

One of the suggestions at the meeting was for a club publication. This paper will be issued for the first time next month and will be known as the *Maryland Motorist*. Most of the reading will be of matter in which Maryland motorists are interested. Frank W. Darling, secretary of the club, is chairman of the committee in charge of the publication.

It was also decided to hold a hill-climbing or a non-stop, sealed-bonnet contest in the near future, while it was also proposed to hold an annual endurance contest.

A. C. OF PHILADELPHIA ANNUAL FOR BRAZIER.

PHILADELPHIA, Oct. 19.—The seventh annual Brazier Cup contest of the Automobile Club of Philadelphia will be held Saturday, October 31, over a roundabout course of about 65 miles—via Lonsdowne, Alden and Swarthmore to Media; via Newton Square and Devon to Valley Forge; thence through Bridgeport, Norristown, Centre Square, Antler, and Chestnut Hill to the Racquet Club in this city. The object of the run will be to keep as closely as possible to the legal speed limit, and the committee in charge has already gone over the ground and decided on a secret minimum, the car coming closest thereto being awarded the cup. The number and variations in the speed limits of townships, villages, cities and open country make the computation quite intricate. Intermediate controls and checking stations will be established, and failure to arrive at either at the time calculated by the committee will mean additional penalties. It is expected that a score of cars will start.

ROAD RULES ADOPTED BY PENNSYLVANIA CLUB.

WILKINSBURG, PA., Oct. 19.—The committee on road rules of the Wilkinsburg Automobile Club has given a vast amount of thought to common-sense regulations governing automobile driving on the public roads. Herewith is the approved report of the committee, and the result of its labors will undoubtedly be interesting to many other clubs:

First.—When passing vehicles going in the opposite direction, keep to your right, and when passing those going in the same direction keep to your left-hand side of the road.

Second.—Speed on heavy descending grades should not exceed 15 miles per hour. Brakes should be tested at top of grade.

Speed elsewhere always under control; this may be 4 or 40 miles per honr, depending on road and traffic conditions.

Third.—Run slow on a descending grade when passing a car or heavily loaded team ascending, giving them the greater right of way. When passing cars on a dusty road, run slowly to prevent dust obstructing the view of the road.

Fourth.—Always sound your horn before passing a vehicle to give timely warning of your intention to pass.

Fifth.—Do not open your muffler when running on streets where the noise would be objectionable to residents.

Sixth.—Approach street or railway crossings under perfect control, prepared to stop if necessary—"Stop, Look and Listen" before crossing steam railroads.

Seventh.—Approach a horse under perfect control, prepared to stop if necessary to assist in getting a timid animal safely past.

Eighth.—Approach curves where view is obstructed under perfect control, expecting to meet a car, keeping well to the right-hand side of the road, sounding the horn frequently to give warning to approaching vehicles.

Ninth.—When passing farm houses where poultry are likely to be on the road, run slowly and give them a chance to get out of the way. Should your car kill any, stop and settle with the owner.

Tenth.—Never pass an automobile disabled without stopping and offering assistance. Every car should carry a manila rope 25 feet long and three-quarters of an inch thick for emergency use.

Eleventh.—Upon observing broken bottles or glass, barbed wire or other tire-destroying material, maliciously placed on the road, stop and remove them. If for special reasons a stop cannot be made, then notify approaching cars of the danger.

Twelfth.—Upon discovering dangerous places in the road, such as holes, land or rock slides, fallen trees, etc., notify the nearest farm or other house, also the first hotel stopped at, with the request that motorists be notified.

Thirteenth.—Light your lamps before it is quite dark, and when standing on the road after dark be particular that your front lights show in the direction of traffic.

Fourteenth.—A continuous sounding of the horn will be known as a distress signal, and when heard by motorists should be quickly responded to.

A NEW CLUBHOUSE FOR WILKES-BARRE.

WILKES-BARRE, PA., Oct. 19.—At a meeting of the Wilkes-Barre Automobile Club many things were taken up which are of interest to automobile owners in general. The most important were the plans for a new clubhouse as drawn up by President Lee, who presided at the meeting. He took up the many advantages to be derived from having an up-to-date building of their own, both to the members and their visitors. The results of the work of the committee on roads improvement was shown in the many highways which are either improved or entirely reconstructed in the vicinity of the city; the recent decision of the grand jury, declaring the bridges across the Susquehanna free bridges; and the movement on foot to have a state road to the Delaware Water Gap. The plans for financing the new clubhouse were discussed, and the following committee appointed to take charge of the project: George F. Lee, A. P. Keifer, P. R. Bevan, Charles Bertels, Frank Scouton, and C. F. Huber.

In regard to the hill climbing contest for next year, all members were unanimous in the opinion that everything possible should be done to make it even more of a feature than ever before; in fact, the idea met with great favor of publishing a small pamphlet to be distributed at the shows this winter, containing views of the previous contests, together with a description of Wilkes-Barre and vicinity, and how to get here over the new roads now in course of construction.

MONTREAL AUTOISTS COMMEND AUTHORITIES.

MONTREAL, CAN., Oct. 19.—At a meeting of the directors of the Automobile Club of Canada, held last week, the following resolution was adopted: "Be it resolved, that the president and directors personally, as well as on behalf of the members of the club, desire to congratulate the chairman and members of the road committee of the city of Montreal for the good work which has been performed in repairing and paving the streets of our city during the past season, and express the hope that the committee will be enabled to compete and maintain the good work accomplished."

At the same meeting reports from the various municipalities where oil had been placed on the roads were read, and the directors are much pleased with the results thus far obtained. The placing of oil on the roads not only abates the dust nuisance but preserves the roads, and will cause good macadam roads to last much longer. It is the intention of the club to place oil on several other good stretches of roadway during the early part of next season.

DELAWARE ELECTS SATTERTHWAITE.

WILMINGTON, DEL., Oct. 19.—A definite move for the marking of public road intersections was taken last night at the annual meeting of the Delaware Automobile Association, held in this city, and it was learned that the association is to have the co-operation of some of the turnpike companies. The Kennett Turnpike Company informed the association that it had procured the signs for its road and was preparing to have them put up. Delaware has been lacking in this matter in the past.

The subject of uniform and reasonable toll rates was also considered, the matter being left for adjustment with the incoming officers. The association is affiliated with the Allied Automobile Clubs of Philadelphia.

The following officers were elected for a year: President, John J. Satterthwaite; vice-president, J. Danforth Bush; secretary, Charles G. Guyer; treasurer, William Staniar; executive committee, Joseph Bancroft, Remsen C. Bernard, John B. Bird, Frank S. Garrett, and William F. Sellerd.

The association now has 140 members, the largest number in its history, and is in better financial shape than ever before.

WHAT ONE PENNSYLVANIA CLUB HAS DONE.

MEDIA, PA., Oct. 19.—To-morrow night will be celebrated the second anniversary of the formation of the Automobile Club of Delaware County, whose history of accomplishment, considering its extreme youth, is remarkable. Organized in October, 1906, with 48 members, it now has 220 on the roll, with numerous additions each month. From the start it has worked for the improvement of roads, the passage of favorable automobile legislation in county and town, the stoppage of speeding, the defense of autoists generally against illegal arrest and fines, and in numerous other ways. In two years it has made Delaware county an ideal motoring ground, and it is now engaged in urging and assisting financially in the improvement of the old Baltimore pike. The celebration to-morrow night will take the form of a banquet, which will be preceded by the annual election of officers.

STATE ORGANIZATION FOR MONTANA.

BUTTE, MONT., Oct. 16.—Last week a meeting of representatives from the principal automobile clubs of this State was held at Helena for the purpose of forming a State organization. All the delegates were enthusiastic for a State body which can co-operate with the American Automobile Association for the improvements of the roads, fair legislation and a better understanding of the automobile generally. E. C. Largey, of the Butte club, was unanimously elected president of the new organization, and returned home full of the plans which it is proposed to carry out for the benefit of the autoist.

ORGANIZING OF CLUBS IN MISSISSIPPI.

NATCHEZ, MISS., Oct. 17.—Under the leadership of Robert B. Bridge the automobile owners of Natchez have organized the Natchez Automobile Club. At the first meeting last week the following officers were elected: President, S. H. Lowenburg; vice-president, S. H. L. Landen; secretary and treasurer, W. H. Aikman. In other cities of the State automobile owners are getting together for other clubs.

THE INCREASING UTILITY OF THE CLOSED CAR

AN ever widening demand for the enclosed car has stimulated manufacturers to produce artistic designs and furnishings in the limousine and landaulet types. The limousine appeals to many discriminating buyers because of its exclusiveness. Planned and built on a plane of excellence, it appeals strongly to those who have a high regard for comfort and quiet richness and seclusion. To those whose inclinations tend that way, there can be no greater satisfaction than to realize that a warm and comfortable means of conveyance is at one's command, when preparations are being made to leave home in attendance upon professional and business duties, and the elements of time and distance become lessened, if not eliminated, from the mind.

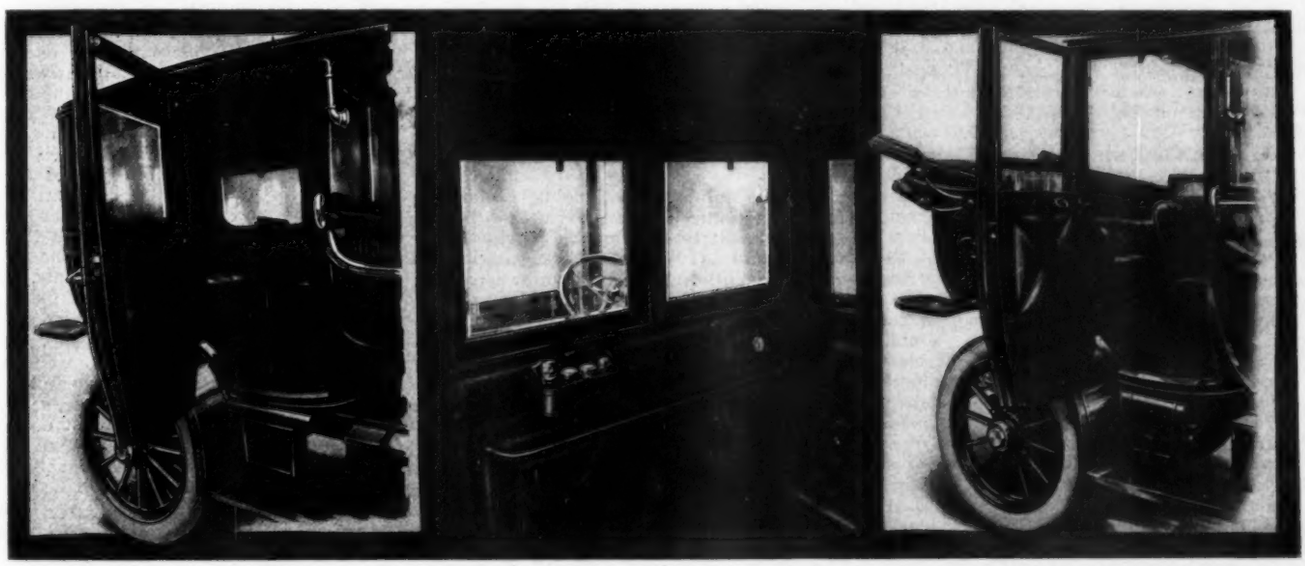
Then, too, shopping may be easily and speedily accomplished with the greatest comfort, for ladies are conveyed to town and from store to store, and then home again in the shortest time possible, and with every convenience at hand. Irrespective of weather conditions the children must be taken to school, and not subjected to sudden changes of temperature, and the limousine thoroughly protects its occupants from all climatic conditions.

When the sun shines and the days are warm and bright, the windows may be dropped in front and at the sides, and thus all the advantages of the touring car are offered. The back furnishes protection from dirt and dust, and the limousine, while ostensibly a car for city use, is thus transformed into an admirable means of country touring.

The landaulet has the increased advantages that the rear half of the top may be entirely thrown back, though still maintaining all the advantages of the limousine, and the landaulet is becoming a most popular means of conveyance as the industry develops. Every detail has been considered with the view of making the Peerless limousine weather tight, and yet to allow for perfect ventilation. The most luxurious upholstering is used, and no expense has been spared in its equipment. Entrance and egress is easily accomplished by means of two steps which are carefully guarded to prevent clothes from becoming soiled. A speaking tube communicates with the driver so that he may be directed without diverting his attention from the road. The tonneau is spacious enough to carry five people with the greatest degree of comfort.

Chassis construction of the new Peerless models shows no radical changes. Improvements take the form of a general refinement of parts as well as their simplified relation. Reliable features have been maintained, yet no new ideas have been set aside because they were new, nor have old features been discarded because they were old. The Peerless limousine offered for the season of 1909 shows clearly the survival of the fittest in motor car building. The tonneau is lighted by two small electric lights of four candle power each. An engagement book, clock, hand mirror and other smaller necessaries are provided, all of which go to complete the equipment of this carefully designed car.

Peerless cars for 1909 are larger, of higher power and more comfortable riding qualities than previous models. The mechanical charges are few and are in degree, not in kind. Each one has been demonstrated by long and careful tests to be a genuine improvement, making the car more simple, reliable, comfortable and more easily managed and cared for. The new body is designed to carry seven people comfortably. Two of the tonneau seats are of the folding types easily detachable and when removed the car is ideal for five passengers.



Showing the Fine Equipment of the Peerless Motor Car Company's Limousines and Landaulets.

NO REGISTRATION FOR UNCLE SAM'S AUTOS.

WASHINGTON, D. C., Oct. 17.—Quite recently a decision was rendered by the Comptroller of the Treasury to the effect that the Federal Government need not pay the District of Columbia authorities for automobile licenses for the numerous automobiles used by the various branches of the Government. This decision has been upheld by the corporation counsel, who likewise holds that automobiles owned by the Federal Government are not subject to a tax by the District government. The latter official has advised the District Commissioners to take no issue on their right to require an official of the United States as "owner" of an automobile to pay the sum of $2 for a license. "I am of the opinion," says the corporation counsel, "that the word 'owner' as used in the present automobile regulations does not include the United States."

The question arose when a bill was sent to the disbursing officer of one of the departments for $2 for a license for the official automobile used by the superintendent of the Capitol. There was some talk of taking the matter to the courts, as there was a possibility that the commissioners might have to issue the licenses without exacting the fee of $2. However, the decision of the corporation counsel has set the matter right by placing Uncle Sam's automobiles on the free list, and there will be no test of the constitutionality of the law requiring a fee of $2 for every license issued to an automobilist.

How the Packard Truck Was Utilized to Break Ground for Factory Addition.

Already possessing what is claimed to be the largest exclusive automobile factory in the world, the Packard Motor Car Company of Detroit is again enlarging the plant by several extensive additions. Several two-story buildings are nearly completed, and ground was broken last week for the first of a series of buildings to be erected on the opposite side of the boulevard from the factory, on a large tract of ground recently purchased by the company.

Between the Twin Cities and Duluth.—While scouting around the country looking over possible roads for the Glidden tour of next year, the Studebaker "Scout" car, with Donald J. McIntosh and "Pete" Estey, last week made a new record between the Twin Cities and Duluth, covering the 174 miles in 7 hours 32 minutes running time. Dr. C. E. Dutton, chairman of the tours and contests committee of the Minneapolis Automobile Club, and R. E. Tucker, automobile editor of the Minneapolis *Tribune*, were in the car and made a careful log of the trip. All kinds of roads were encountered and the record of 7 hours 32 minutes shows that some fast driving was done by McIntosh, who has something of a record as a "speed peddler." Sand predominated, in some places being six and seven inches deep. There are several stretches of corduroy road, some sharp hills with sand, and about fifty miles of the distance is good turnpike where the time can be made. The hotel accommodations in the Twin Cities and Duluth are ample, and everything considered the Glidden tourists would be given a cordial reception in the Northwest.

Lubrication for Racing Cars.—W. T. Kincaid, representing A. W. Harris Oil Company, Providence, R. I., who was in New York attending the Sweepstakes races, where he furnished a number of cars which made a good showing in the different events, including two winners, says that his company is very proud of the record made by Harris oil in this year's racing, giving the following noteworthy performances: The road races at Savannah, Briarcliff and Lowell; Motor Parkway Sweepstakes, where the Buick and Isotta both won their events; the last 24-hour race at Brighton Beach, in which the Simplex made a new record; the 24-hour race at Milwaukee, won by the Locomobile, with a Mitchell second; Bridgeport hill climb; 100-mile stock car race at Elkwood Park, and Ralph De Palma's car, which made new records at Providence on October 10.

Matheson Annual Meeting.—At the annual meeting of the stockholders of the Matheson Motor Car Company, held at Wilkesbarre last week, the withdrawal of Charles W. Matheson from the presidency to assume the presidency of its selling company, the Matheson Automobile Company, necessitated the election of a new president, Colonel Asher Miner being chosen to succeed him. J. W. Hollenbeck was elected vice-president, Frank Matheson was again chosen as secretary and general manager, R. Nelson Bennett was re-elected treasurer and Daniel C. Mackay, assistant treasurer. The list of directors is the same for this year as for last, except that John C. Bridgman, of Wilkes-Barre, Pa., and E. S. Fretz, of Pottstown, Pa., were elected to fill the vacancies caused by the withdrawal of the Palmers of New York City. The list of directors now includes: J. W. Hollenbeck, I. M. Thomas, John A. Turner, Asher Miner, W. C. Shepard, B. Nelson Bennett, W. H. Son, Frank Matheson, Charles W. Matheson, John C. Bridgman and E. S. Fretz.

A Successful Mountain Trip.—What proved to be a thoroughly enjoyable trip, as well as a strenuous test for the car, was recently completed by Richard M. Shaffer of the Shaffer Manufacturing Company, Baltimore, Md. The tour was through the mountains of West Virginia, Maryland and Virginia, where the road conditions at times were not all that could have been wished for, in fact between Hancock and Cumberland, where the route passed over five mountains, the roads were so stony as to be almost impassable. On the return trip between Winchester, Va., and Berkeley Springs, W. Va., the sand at times was the worst ever encountered by Mr. Shaffer. In all he covered about fifteen hundred miles, using a 1907 Pullman of 20-horsepower, with which he had no trouble, being lucky enough to escape without even a puncture.

A 1,600-Mile Road Test.—A sealed bonnet test of the new $1,600 Jackson car is to be made during a trip from Jackson, Mich., to Bangor, Me. The start will be made next Monday. The passenger list will embrace E. P. Blake, of Boston, New England distributor of the Jackson; Richard Palmer, of Sea Neck Park, N. J., and Dr. C. G. Percival, of New York, the company's publicity manager. Arrangements have been made for reception of the car by the four organizations of Philadelphia, Boston, Portland and Bangor. The idea is to have newspaper men in the car as checkers all the way from Jackson to the finish at Boston on November 1. A schedule averaging 200 miles per day has been framed up in the 1,600 mile trip.

A Story from the West.—Here is a story from out of the West, brought to Chicago by W. K. Cowan, Rambler representative for Thomas B. Jeffery & Co., Los Angeles, Cal.: Two California motorists, traveling in opposite directions, met in a collision on the public road. Both were thrown from their cars but neither was injured, though both cars were badly damaged. "I'm going to sue you for damages," cried one when he got his breath. "I'm going to sue you for damages," shouted the other, wiping the sand out of his eyes. "It was your fault," said one. "No, it was your fault," said the other. "Well, it will cost us $250 apiece to get our cars fixed," ventured one. "And it would cost us $1,000 apiece to bring suit," said the other. "In that case, let's shake hands and save $1,250 each." They did.

Mooers Building Taxicabs.—Louis P. Mooers has entered into the exclusive manufacture of taxicabs and town cars for the Cleveland Autocab Company, of Cleveland, which has established a large plant at Geneva, O., with capacity for a large number of cars. Mr. Mooers is well known to the automobile world as the designer of the Gordon Bennett Peerless racers and Barney Oldfield's Green Dragon. He was until recently the superintendent and designer of the Moon Motor Car Company of St. Louis.

One Agent's Good Scheme.—To create a profitable rivalry among his chauffeurs H. Bartol Brazier, Philadelphia agent for the Marmon car, has offered a gold watch to the chauffeur in his employ, or in that of an owner who stores at his garage, who can show the most economical operation for November. A similar contest last May was closely contested and was won by Ralph Green.

The Rome-Tourney Radiator Company, formerly known as the Long-Tourney Manufacturing Company, of Rome, N. Y., has changed its name for various reasons. The capacity of the plant has been tripled and the output for 1909 will reach 50,000 radiators. In addition a quick repair department has been provided, where the company will take care of any make sent in for that purpose.

A Large Tire Contract.—What is probably one of the largest tire contracts ever given to a tire company has just been made by the Ajax-Grieb Rubber Company, which has agreed to deliver to the Maxwell-Briscoe Motor Company 29,000 tires before July 1, 1909. These 7,250 sets will be used as standard equipment on Maxwells in 1909.

Pennsylvania's Tags.—Over 24,000 automobile tags have been issued by the Pennsylvania State Highway Department during the present year. The 1909 tags, which will be ready for delivery by December 15, will be white with black lettering. It is expected that nearly 30,000 of the new tags will be required.

IN AND ABOUT THE AGENCIES.

Stoddard-Dayton Agencies in South America.—Sigmund Krausz, who has been acting as a South American representative for the Dayton Motor Car Company, has established Stoddard-Dayton agencies in Havana, Rio de Janeiro, Montevideo and Buenos Ayres.

Mr. Krausz found that the European makers had a good foothold in South America, but he succeeded in convincing the dealers that the American car of today is a worthy competitor.

Rambler, New York City.—Manager Hutchinson, who has charge of the agency department of Thomas B. Jeffery & Co., while in New York recently completed arrangements for the establishment of a wholesale distributing house for the Rambler in the East. The upper floors of the building occupied by the local agents, Homan & Schultz, on Sixty-second street, near Broadway, will be utilized. The present agent will look after retail sales and retain its present territory.

Firestone Tires, Boston.—The Boston branch of the Firestone Tire and Rubber Company, which has been located at 9 Park square, has removed to 145 Columbus avenue, the store formerly located by the Rambler agency. Manager T. J. Glenn is making extensive alterations, which, when completed, will give the Firestone agency much larger quarters than heretofore.

Pope, Los Angeles, Cal.—The Pope interests in Los Angeles will be handled by the newly-formed William R. Ruess Automobile Company, situated at 1028 South Main street, after November 1. This company is making extensive improvements which when finished will give it one of the finest salesrooms and garages on the Pacific coast.

Pierce Arrow, Baltimore.—The Foss-Hughes Motor Car Company, agent for the Pierce cars in Philadelphia and vicinity, has established a branch in Baltimore, with temporary offices in the Equitable Building. Frederick E. Devlin will be in charge.

Franklin, Cleveland.—The Standard Automobile Company, agent for the Packard, has taken on the Franklin line for 1909. F. A. Stock, of the former Franklin agency, has accepted a position with the Standard company.

Grout, Philadelphia.—The Grout Automobile Company has recently closed a deal whereby the Stoyle Automobile Company, of 1521 Spring street, will act as Philadelphia agents.

American, Pittsburg.—The Pittsburg interests of the American Roadster will be looked after by P. C. Wood and R. G. Wood, who have opened salesrooms on Wood street.

Franklin, Greenville, S. C.—C. M. Wing, of Greenville, S. C., has taken the agency for the Franklin car, and will be located at his new garage on Buncombe street.

Diamond Tires, Seattle. — C. E. Mathewson, Pacific representative of the Diamond Rubber Company, is preparing to establish a branch at Seattle, Wash.

Baker Electric, Wilkinsburg, Pa.—The Wilkinsburg Auto Garage, located on Hay street, have secured the agency for the Baker Electric.

Overland, Boston. — Hereafter the Overland interests in Boston will be taken care of by J. M. Linscott.

PERSONAL TRADE MENTION.

E. Le Roy Pelletier, advertising manager for the E-M-F and Studebaker Automobile Companies, was in New York last week. Mr. Pelletier is making a tour of all the larger cities visiting the E-M-F representatives and Studebaker branch managers. His trip will not only take him through the South and East, but before he returns to headquarters again he will have visited Los Angeles, San Francisco, Portland and Seattle, besides a number of places along the northern route on his return from the West.

Frederic Coleman, for several years manager of the London branch of the White Company, arrived last Friday on the Mauretania for a short visit to this country. Mr. Coleman has been active in making the White steamer prominent in England, and on his arrival here spoke very optimistically of the outlook in the British Isles for the coming season.

Harold Stillman, who has been a prominent figure in the automobile trade in Philadelphia for some years, died at his home in Hartford, Conn., after a two-weeks' illness with typhoid fever, which turned into peritonitis toward the end. Mr. Stillman had been successively connected with the Mercedes, the Pennsylvania, and later the Foss-Hughes Company.

Olds to Become an Aviator.—Another convert to aerial navigation has been obtained in the person of R. E. Olds, president of the Reo Motor Car Company. He is scheduled to make a flight in company with Charles J. Glidden, at Springfield, Mass., on or about October 24.

F. B. Read, for the past four years with the selling department of the Springfield Metal Body Company, Springfield, has severed his connection to accept the position of assistant manager of H. J. Koehler Company, of Newark and New York City.

Arthur Holmes, assistant mechanical engineer for the H. H. Franklin Mfg. Co., who is visiting the Franklin agencies through the West, including the Pacific Coast States, sends word that the automobile business in that section is very active.

Thomas R. Roberts, who has been acting as assistant manager of the Philadelphia branch of Thomas B. Jeffery Company, has been made manager in place of William F. Smith, who has resigned.

Frank L. Kimball, who has been connected with the Chicago branch of the Autocar for some time, has gone with the Bird-Sykes Company, agents for the Matheson and Corbin in that city.

Charles W. Mears, of the Winton Motor Carriage Company, is making a tour of the East investigating the advertising situation at the different Winton branches.

C. W. Moody, who has had charge of the Pennsylvania Rubber Company branch at Cleveland, O., will hereafter be in charge of the Western territory, with headquarters at Chicago.

Fred McAllister, former automobile advertising manager of the New York *Sun*, has joined the motor car advertising department of the New York *Times*.

BUSINESS DIFFICULTIES.

Baker Company of New York.—The Baker Motor Vehicle Company of New York, doing business at 1788 Broadway, was last week forced into involuntary bankruptcy by the action of some of its creditors. This action had been anticipated for some time, in fact ever since a year ago, when the business formerly carried on by the C. B. Rice Company was reorganized and carried on by the new company in the hope of working out the debts which had been contracted under the old management. It was impossible for the company under the business conditions existing for the past year to operate at a profit and the creditors deemed it advisable to cause the liquidation of the company. This company has no relation to the Baker Motor Vehicle Company of Cleveland, except that it sells the cars made by the last mentioned company. As soon as the bankruptcy proceedings are ended it is expected that the business will be completely reorganized and carried on with new capital put into it. Liabilities are placed at $100,000 and assets from $20,000 to $30,000.

RECENT INCORPORATIONS.

Standard Universal Rim Company, Jersey City, N. J., to manufacture and deal in metal rims and parts. Capital $50,000. Incorporators: B. S. Mantz, J. R. Turner and S. A. Anderson.

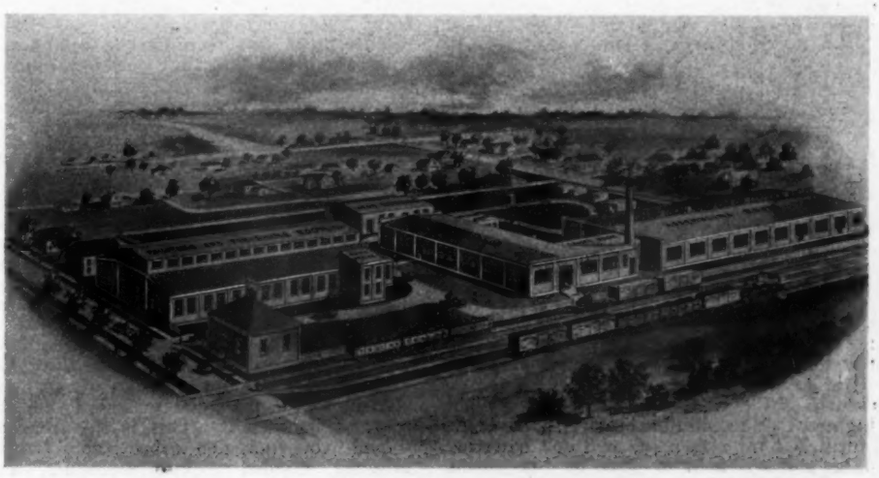
Rex Electric Company, of Kingston, N. Y., manufacturers of electrical lamps. Capital $600,000. Incorporators, E. M. Betts, C. J. Kleber and B. B. Maloney.

Champion Tire Company, Syracuse, N. Y.—Manufacture tires. Capital, $100,000. Incorporators, Q. C. Reed, E. O. Kinne and S. G. Schlachter.

Preston Fabric Tire Company, Buffalo.—Capital $100,000. Directors are Christian Wesp, M. R. Evans and J. F. Preston, of Buffalo.

Southern Tier Motor Company, Elmira, N. Y.—Capital, $25,000. Directors: G. N. Shoemaker, C. S. Satten and H. K. Crandall.

G. H. Pexley Company, Boston.—General automobile business. Capital $50,000. Charles H. Tebbetts, Marshfield, president.



New Factory of the Gramm-Logan Motor Car Company, Bowling Green, Ohio.

INFORMATION FOR AUTO USERS

Stewart Speedometers for 1909.—The Stewart & Clark Mfg. Co., of Chicago, maker of Stewart speedometers, announces that a number of attractive features have been added to the regular models, and that the line has been increased by two new models. A reduction in price in the $75 ninety-mile model to $50 is announced.

Both this and the $40 model will have a new and unique trip recorder of three dials indicating the mileage in miles and tenths, with an automatic resetting device, different in construction to anything of the kind on the market. These models will be equipped with a maximum speed hand. A feature of the mechanism operating the trip and maximum hand is the elimination of springs and other devices liable to derangement.

STEWART MODEL 4.

The new models are No. 11, at $25, and No. 12, at $15. The $25 model, which is of new construction, indicates speed from 0 to 60 miles and has a new trip recorder and resetting device. Owing to the indicator being mounted in the center of the dial, the scale is three times as long as is ordinarily used. The $15 model, which is the same in design as the $25 model of last season, has a 50 mile scale and 10,000 mile season odometer. It is three inches in diameter and has a number of refinements in construction, which its makers believe will insure satisfaction.

MODEL 11. MODEL 12.

TWO NEW STEWART SPEEDOMETERS FOR 1909.

All models will be equipped with the Stewart & Clark flexible shaft and swivel joint and are guaranteed absolutely for five years.

New Rear Lamp.—A new rear light, known as Foy's patent automobile rear light, is being manufactured by Meisel Press & Mfg. Co., 944 Dorchester avenue, Boston, which has some special features. It is an electric lamp which fastens permanently to the rear of the car, and may be lighted by any ignition battery, bulbs being furnished for either 4-6 or 8 volt batteries. The globe is held in place by two spring terminals which, the makers claim, will prevent any possibility of the globe loosening or dropping out. As shown by the accompanying illustration, the light is placed horizontally and parallel with the back of the car, thus throwing the light well over the number plate, and through the ruby light, which is directly in front. The rear half of the lamp box is hinged to facilitate cleaning the silvered reflector. The number plate holder attached to the lamp is made so that it will take any size State number plate without the use of any tools, because of the spiral springs which hold the plate in place.

FOY AUTOMOBILE REAR LIGHT.

"Myhtib" Tire Overcoat and Inner Tube Patches.—The Myhtib Composition Company, of Hartford, Conn., is producing a preservative for the outer shoe or casing of tires which is of especial interest to automobile owners. Anyone familiar with rubber tires knows that they will deteriorate and lose their life if left standing unused for any length of time, the rubber being kept in much better condition if the tire is in use. The manufacturers of this new composition claim that when the "Myhtib" overcoating is used this loss of life will not take place. They especially recommend it for use when a car is jacked up for the winter, and also to dealers who carry cars in stock for two or three months with tires on before sold; also for keeping the extra tires carried on the car in the best condition. This "tire saver" comes in an outfit composed of a cake of "Myhtib" composition and a bottle of "Myhtib" preserver; the cake being melted and applied while hot.

TRADE-MARK OF THE MYHTIB PATCH.

This company is also making a tire patch which has the good qualities of being sold with the cement on in shape to be applied to the injured spot, and the consequent feature that the patch may be put on in three minutes. The patches are sold in one size only, 2¾x2⅜ inches, and are placed in boxes of five.

Oildag.—The Acheson Oildag Company, of Niagara Falls, N. Y., are manufacturing a mixture of deflocculated unctuous graphite and oil, which they claim will not only reduce the oil consumption, but increase the power of the engine and prevent pitting of valves when used according to their instructions. This mixture is in the form of a paste, and when mixed with the quantity of oil specified on the package it gives an amount of graphite content to the oil equal to .35 of one per cent. of its weight. This is the same as though you took one cubic inch of solid graphite, divided it into molecules, and mixed it with three gallons of oil. It is said that instead of the usual 200 miles per gallon of oil, as advised by a number of car builders, a machine using Oildag will do over 600 miles on one gallon of oil. Because of the graphite, which, as an impalpable powder, is carried by the exhaust and deposited on the metal surfaces, the claim is made that all future pitting is effectually prevented. The product is put up in three sizes of packages, the smallest enough for one gallon of oil, one for five gallons, and the largest for ten gallons.

Thomas Shock Absorber.—The shock absorber shown in the illustration is manufactured by the Buffalo Specialty Company, which has bought the plant of the Thomas Spring Works, Canisteo, N. Y., and transferred all the machinery, patterns, etc., to one of its Buffalo factories, where the manufacture of Thomas shock absorbers will be extensively carried on. A number of improvements have been incorporated into the device. Among the advantages claimed for this form of shock absorber might be mentioned the increased ability of the lever arm of the spring by the length of the lever arm to the point of application of the force. This same length of lever arm will reduce the periodicity of the oscillations. The makers point out that the shock absorbers afford the snubbing phenomenon during the period of reaction only. In this way the tendency to disrupt the spring leaves will be less, if not entirely eliminated, while the rebound, which is the matter to be considered, falls off to very comfortable proportions. The very fact that the periodicity of the oscillations would be reduced by the length of the lever arm tends to reduce the lateral rolling of the body, which in itself is an extremely important matter. Obviously this device should occupy an important nich by way of an accessory to the automobile, if it will reduce the rebound and more or less eliminate lateral rolling. It is not alone in the matter of spring breakages that these disagreeable factors have to be noted, but because the rack shock and the products thereof are by way of considerable increase in the cost of upkeep of the cars. The makers of this shock absorber claim that they very materially reduce the factor of upkeep.

IMPROVED THOMAS SHOCK ABSORBER.